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A New Profession Is Born[1]

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SPECIAL knowledge and technical skill, integrity and allegiance to established ethics are implied in the term, "profession."

By naming as its objective the improvement of "the nutritional status of human beings," the American Dietetic Association closely allied itself with those other professions, the medical and the nursing, that devote themselves to the well-being of humanity. Like the others, our Association's Code of Ethics subordinates reward and gain to service.

The seal of this Association symbolizes its aim and spirit: the balance signifies adherence to scientific accuracy; the caduceus, dietetics' relation to medicine; the cooking vessel, the art of cookery; the cornucopia, an abundant diet; the sprays of wheat and acanthus, growth and life; while the motto, "Quam Plurimis Prodesse," re-affirms the primary purpose—"the greatest good of the greatest number" or "benefiting the greatest number."

With the formal adoption of these ideals, a new profession—dietetics—joined the ranks of those established. But long before, the newcomer had been conceived and had been gradually developing, and feeling its way, steadily gaining strength in membership, and testing itself through painful trial and sobering error. While not expressed in seal or Constitution, the spirit of service to humanity from the very inception of the American Dietetic Association in 1917 has continued to give it a sturdy growth. The planners and builders exemplified this spirit, as have the guiding pilots of the intervening years. The ship might rock but it kept steadily on its course, for courage and high purpose kept the hands steady at the helm.

THE EARLY BACKGROUND OF THE DIETETIC PROFESSION

Who was the first dietitian? Medicine has its father, Hippocrates; nursing has its Florence Nightingale; home economics its Ellen H. Richards. The practice of dietetics, the use of diet to maintain health and treat disease, however, is so old that the dietetic historian loses himself in the mazes of antiquity when he seeks to name the first dietitian. Throughout the ages diet has been a tempting subject, open to endless fanciful, sensational, and sometimes sage observations. The Ebers papyrus, written perhaps a thousand years before Hippocrates, contained what may be the first recorded diet prescription. Yet so much has happened in this branch of medical therapy within the last four decades that we look on dietetics and nutrition almost as a new art and science, forgetting that from the very dawn of medical history the subject has caught and held the interest of thinking people.

A prototype of the dietitian flourished under another name hundreds of years before the birth of Christ, when Pythagoras, sometimes adjudged the wisest of all Greeks, advocated the exact measurement of victuals and drinks. The *Apicius*, the world's oldest known cook book, dating from imperial Rome, is filled with dietetic principles still sound today. Apicius' techniques retained the mineral salts in his vegetables. He recommended the use of fish livers. He used a method of removing the peeling of vegetables that foreshadowed our modern power vegetable peeler. He had a strange intuition for conserving the more essential elements in foods that functioned in the absence of scientific facts. His ability to translate empiric, traditional knowledge into practical rules, derived from more or less well understood principles, still is characteristic of many cooks today.

A remarkable instance of early and practical dietetics was the *garum* mentioned by Apicius. Made from the preserved livers of fish, it was renowned in ancient Rome for its medicinal properties. When it came to vitamins, the Greeks had a name for it—*garum*.

In a Chinese medical book written during the Tang dynasty of the seventh century appears an account of night blindness and its dietary cure. Another of the incunabula of the dietetic profession is the *Regimen Sanitatis*, a collective work on food written in the thirteenth century which influenced medical practice

[1] Material from this paper will later be adapted for use in the *History of the American Dietetic Association*.

for centuries. According to Celsus' *De Re Medica*, published in Florence in 1478, medicine was then divided into three branches: one dealing with diseases to be treated by diet, the second by medicines, and the third manually. Innumerable and often lengthy dissertations on food and diet have appeared in every medical literature known to students of archaic science.

History repeats itself; scenes change, but actors are much the same. The Renaissance, too, contributed its prototype of the dietitian in the learned Dr. Thomas Moffet, "whose mother died of a surfeit of pig's flesh," a mishap which probably directed him to the study of foods. Born shortly after the time of Paracelsus, the Swiss physician and philosopher, and about twenty years after the death of Leonardo da Vinci, Moffet defined diet ("as it is usually taken by the vulgar, and also the best physicians") "to be an orderly and due course observed in the use of bodily Nourishments, for the Preservation, Recovery, or Continuance of the Health of Mankind." Nearly four hundred years later we were to define food as "that which taken into the body" and so on!

Others of Moffet's lines have a strangely familiar sound, as "So now in our Days, the name of Diet seems but a scar-crow to the unwiser sort, who think it best Diet, to keep no Diet at all." Again we see the modern touch when he refers to the "thin Diet" which he rather scornfully calls the "Inch Diet," wherein "we eat by Drams and drink by Spoonfuls," which, he says, "more perplexeth the Mind than cureth the Body . . . ingendering a suspicion over every Quantity, Dread, Fear and Terror, over every Proportion (bereaving the Head of Quietness, the Heart of Security and the Stomach consequently of good Concoction)." Immediately we are reminded of the furor a few years ago over the 5 and 10 per cent vs. the 3, 6, and 9 per cent carbohydrate classification of vegetables; the carrying of the diabetic's food prescription to the second or third decimal point; and the harvest of problems we have reaped through over-concern in the feeding of the young.

Well may the thoughtful conclude there is little new under the sun. According to Moffet the wise have always sought "the more abundant life" through the channels of health. Galen, "being three or four times sick before he was 28 years old, looked afterward more strictly to his diet in such sort that 100 years following he was never sick but once and died only for want of radical Moisture." Hippocrates, too, lived until he was 109 years old, or at least, as Moffet says, "till he was four-score and five. . . . Yet he had by Nature a weak head inasmuch that he ever wore a Night-cap. Wherefore let us neither with the Impudent, call Diet a frivolous Knowledge, or a curious science with the Imprudent; but embrace it as a Leader to perfect Health." Today we echo this closing sentiment in our search for the modern Mecca of a longer period of productive and more buoyant life.

TRANSITION FROM THE OLD TO THE NEW IN DIETETICS

The Furnases in *Man, Bread and Destiny* have told the story, shocking at times, of man's rise from the savage brute of a million years ago to what we sometimes term the civilized man-animal of today. They intimate that man has reached his present state of development because he is omnivorous. They add, however, that diet can only furnish the proper environment for a given inherited destiny: despite the views of faddists, diet cannot make a timid man brave or change an indifferent appearance into beauty. But diet may in many ways indirectly shape the course of evolution. That man can and does exist on a much wider variety of foods than do other animals and so can live on almost any part of the globe, accounts in some measure for his ascendancy. With his dietary adaptability came versatility, and with versatility came advancement. Unhandicapped by restrictions in food tastes, he could wander at will, sure of a meal wherever he went. His wanderings got him into trying situations where he had to begin to think in order not to be eliminated. Food and diet must have played a leading role in the destinies of prehistoric races—average or giant.

Some diets must have been adequate, since man survived; yet the Furnases believe that up to fifty years ago he had not gained, he had retrogressed nutritionally. There were no experimental nutritionists in antiquity. While Hippocrates made much of treating disease by diet and many of his speculations happened to be sound, twenty-two hundred years were to elapse before scientific nutrition as it is known today began to take the place of empiricism.

In 1794 Lavoisier opened the modern era of the science of nutrition with his determination of the end results of the digestive activities. The scientific heritage from the father of the modern science of nutrition, Lavoisier, is traced in the "family tree" prefacing Graham Lusk's classic *Science of Nutrition*. In this and his later monograph, *Nutrition*, Lusk has given us a graphic record of the history of nutrition from ancient times down through the Middle Ages. In the pages of his writings the great company of seventeenth and eighteenth century scientists—Sanctorius, Black, Cavendish, Lavoisier, and others—live again.

The late Dr. Walter B. Cannon, also among the great in his influence on scientific thought, has said that the fathers of medicine regarded three structures—the lungs, the heart, and the brain—as the tripod of life. If any one of these structures fail, the whole intricate organization of the body goes to pieces. But supporting this tripod, like Atlas up-

holding the heavens, is our receptacle for food, the digestive system—inured to abuse, capable of having parts removed, yet of basic value to life. Very slowly has our knowledge been acquired of the nicely interrelated processes that take place after food is chewed and swallowed and thereafter altered so that it becomes soluble and capable of passing through the intestinal wall. Still more slowly, perhaps, shall we attain a reasoned understanding of the mind-body processes as they affect not only digestion, but in turn health and disease.

While the lineal ancestors of today's dietitian have gone on record through all ages, ever since man began to note that cause and effect applied as much to the food he consumed as to the instruments he devised for his protection or aggression, the dietetic profession as we know it today is a development of the fast-moving twentieth century. Trial and error had built up a body of empiric knowledge, some of which withstood a later studied and critical scrutiny, but the art of dietetics was to join hands with the science of nutrition before the dietitian reached a stature which was to justify a distinct professional rating. Then a new profession was heralded: that of the dietitian, skilled in the arts and learned in the sciences pertaining to the selection, preparation, and use of food. Full recognition of this professional stature by the dietitian's colleagues in related professions as well as by the public, was to await the development of a strong and well-integrated national organization.

THE COOKING SCHOOL AND THE FIRST DIETITIAN

Nearly sixty years ago the *Journal of the American Medical Association* stated editorially: "It is our firm belief that until the domestic arts of the kitchen and dining room attain a rank of dignity . . . until they are taught very much as music and painting are taught, it is going to fare very badly with all of us." In 1887 the American Medical Association appointed a Committee on Dietetics and in the same year we read editorially: "Is sufficient attention now being given to it [dietetics] by the American medical student? Or is the average practitioner as well posted as he should be upon these topics? We should give the physician as much knowledge upon the preparation of food for the sick as the trained nurse. . . . Which American college will be the first to have a Professor of Gastronomy, or, if preferred, of Dietetics?"

Those were the days, be it remembered, when women were ladies. Domestic arts they must learn, but in a ladylike way just as they dabbled in music and painting. Reserve and caution hemmed them in. They were bound by such dicta as these proclaimed in Miss Leslie's *Behaviour Book: A Manual for Ladies*, published in Philadelphia in 1835: "Ladies no longer eat salt fish at a public table. The odor of it is now considered extremely ungenteel . . . Most American ladies beyond the age of 35 look better in caps, even if their hair shows no sign of middle age." As for the word stomach, "it should never be uttered at table, or indeed anywhere else except to your physician, or in a private conversation with a female friend interested in your health." In those days one did not "pass away" for lack of vitamins. One died—as did a lady now in the Pilgrim Burying Ground at Plymouth—"of a Languishment."

Restraint, too, marked the menus in the hospitals of that period and the late eighteenth century. Mush and molasses were served for breakfast on Mondays, Wednesdays, and Fridays, varied by mush and molasses for supper on Mondays, Wednesdays, Thursdays, and Saturdays. How simple the cost accounting, the checking of incoming supplies! According to the visiting committee of the old New York Hospital "the patients were generally well satisfied with their meals" which "combined a proper regard for frugality in administering hospital funds, with a due respect for the comfort of the patient." (Need more be said?) The still older Pennsylvania Hospital, on the other hand, showed a far more sprightly spirit. There the mush and molasses were enlivened at supper by a pint of beer, but the "plentiful supply of brandy rum" also authorized was piously stated to be used "chiefly" for bathing wounds. Not until the War of 1812 were "the fruits of the season" added to the New York Hospital's menu and then merely "by way of relish." This ladylike attitude toward man's gross need for food was to continue for more than a hundred years.

The omnipresent canned tomato, still "by way of relish," figured in the Garrison and Travel Ration of our troops during World War I. In the *Army Cooks Manual* for 1910 and 1916 tomatoes were listed solely as the "seasoning component" of the ration. Favored only for flavor, in many areas of the war zone in France they proved to be the only reliable source of antiscorbutic vitamin in the entire dietary. (The discovery of ascorbic acid came too late to disturb the academic calm of those who devised the Army ration for troops in France in World War I for, in the writer's experience, no canned fruit juices were ever issued in the Advanced Sector area where she served.)

Happily, long before World War I the blight that had fallen on American domestic arts, judged by the foregoing editorial comment, was lifted by the cooking school that came out of France, like Lafayette, to save America or at least its collective stomach. In the 1870's, Monsieur Pierre Blot, armed with his *Handbook of Practical Cookery for Ladies and Professional Cooks*, arrived to present the cooking school to America. Introduced as a "professor of gastronomy," he was undoubtedly one of France's greatest gifts to the American housewife and may have been

indirectly responsible for awakening the need of more "professors of gastronomy" in American colleges.

In the wake of Professor Blot there arose several culinary temples devoted almost exclusively to the high artistry of food preparation and presided over by such priestesses as Juliet Corson; Mary C. Lincoln; Maria Parloa; Anna Barrows; Fannie Farmer, the "mother of level measurements"; and notably Sarah Tyson Rorer.

That these cooking schools of the seventies, eighties, and nineties laid the groundwork for the dietetic profession in America seems indisputable; and that Mrs. Rorer, who was a "true scientist and made her craft a fine art," qualifies best as the predecessor of the modern dietitian, in fact *was* the first American dietitian, seems also indisputable. Viewed in the light of the physical and mental durability of today's dietitian, she qualifies farther, for she lived to be eighty-five and maintained her professional interest to the end.

Mrs. Rorer achieved the distinction of editing a department in the *Dietetic Gazette*, published under the auspices of the American Medical Association in the eighties and nineties. Interestingly enough, during the same period, that Association formed a Committee on Dietetics, influenced possibly by Mrs. Rorer's firm statements in the *Gazette*, such as, "If I could make the cooks of the nation, I would care but little who made its apothecaries"; and these farsighted ones, "A man may eat until he can eat no more and still be ill fed" and "It would be unwise to lay down a general diet for all men." We repeat, much that we observe today has been observed and recounted before, and often in slogans and phrases as forceful and graphic as our own. Even our "morale vitamin" is not new. The *Dietetic Gazette* had one: an advertisement claimed that "Bovinine" would "still the beseechings of an exhausted nerve for food."

Years ago the late Dr. Paul G. Shipley epitomized in the *Journal of the American Dietetic Association* the respect and admiration we all feel for these early workers in the sciences related to the health and well being of mankind: "They worked stoutly and never doubting amid disadvantageous circumstances undreamed of today and they observed as well or better than we do." Witness the young Army surgeon, William Beaumont, the pioneer American physiologist, who gave the world its preview of the human stomach in action. He carried on after the great Lavoisier's head rolled under the impact of the French Revolution. He worked back from Lavoisier's study of the end results of digestive activities to a study of the digestive process itself and opened the door for the biochemists of the twentieth century.

DIETETICS PRIOR TO WORLD WAR I

The dietitian's sphere of influence prior to World War I was largely limited to the "diet kitchen," the "feeding of the sick," and the instruction of nurses in this feeding of the sick. Medical practitioners were just beginning to take due cognizance of Osler's aphorism, "Treat the patient rather than the disease," a concept which, together with the modern accent on scientific nutrition, has broadened into today's public health goal of preventing the disease. It is not surprising, then, that the dietitian, always the handmaiden of the physician like the goddess Hygeia in the temple of Esculapius, up to now was assumed to be concerned solely with the care of the sick.

While the cooking schools of the nineteenth century seem to have been the precursor of the dietetic profession, what Cummings in *The American and His Food* terms the "concept of scientific eating" for the well did not begin to be a vogue in America until late in the century. Strange and ill-founded notions concerning food, to be sure, had floated around. Nevertheless, it was not until 1906 when Wilbur O. Atwater and A. P. Bryant, the first in America to be credited with making careful analyses of foods by European methods, wrote their famous, and to dietitians, well-thumbed Bulletin 28, that Americans began to dwell on the composition of foods. This dietitians' bible," *The Chemical Composition of American Food Materials*, was followed by the work of Professor Russell H. Chittenden, who established the first physiological chemistry laboratory in the United States. He lived to be more than eighty and was to see the science of nutrition in his lifetime rise from a position at zero to a height where strong men drink milk and the whole world knows its vitamins. It was not, however, until the advent in 1911 of Professor Henry C. Sherman's classic, *Chemistry of Food and Nutrition*, that scientific nutrition could be said to have been safely launched in America. Even so, it was the gripping story of the vitamins and the magic, undiscernible to the naked eye, that lies in them, that served to catch and hold the public interest. A happy balance between the chemical and biologic sciences was assured by the work of such great men as Professors Elmer V. McCollum, Lafayette Mendel, and Graham Lusk.

Thus at the turn of the century the stage was set for a changing emphasis in the practice of dietetics. With the advent of the "newer knowledge of nutrition" the dietitian of the 1890's was to come out of the diet kitchen, where she had been preoccupied with the feeding of the sick, and advance to a broader field. No longer were the terms "diet," "dietetics," and "dietitian" to be associated solely with that branch of medicine called "diet therapy."

THE DIETITIAN VOLUNTEERS FOR WAR SERVICE

Prior to 1900 we have no records of any organized group action on the part of dietitians. In that year Maria Daniell gave a report on hospital dietaries at the Lake Placid Conference on Home Economics

and in 1904 the courses in dietetics at the University of Wisconsin were reported. In 1905 Ellen H. Richards commented on dietary calculations, and in 1906 (coincident with the birth of the "vitamines") Grace McCullough discussed "the need of the dietician and her training." References were made to the three-month summer courses in New York for students from Pratt and Drexel Institutes and Teachers College, Columbia University. In the discussion by Mary Swartz (the late Dr. Mary Swartz Rose) and Lenna F. Cooper which followed, both the terms "dietist" and "dietician" were used. In 1908 Adelaide Nutting used the spelling "*dietitian*" which was also observed in other references. (Incidentally, the terms, "dietitian" and "nutritionist" were defined and discussed at the Social Service —now Community Nutrition—Section meeting of the American Dietetic Association at Toronto in 1930, and redefined officially by the Association in 1940.[2] In seeking for the origin of the term "nutritionist," the writer, who first recalled having heard it used at Teachers College, wrote to Mrs. Rose in 1940 and received this reply: "About 1920 we were saying 'nutrition worker' but that was awkward. and gradually 'nutritionist' was substituted . . . probably between 1920 and 1925").

August, 1914, saw the beginning of World War I. In November, 1916, according to available records, the first organized group of dietitians was formed—the New York Association of Dietitians (now the Greater New York Dietetic Association) with Elva A. George as president. Miss George later became director of the American Red Cross Dietitians Service which enrolled the first group of dietitians for Army duty in time of war.

The foment of war always breeds the catalysts productive of constructive as well as destructive movements, of both heroic and ignoble action. The time was ripe and the stimulus of war hurried the need for a national organization of dietitians. Rich and productive America for the first time was forced to conserve food for an Army that grew, like a giant mushroom, almost overnight, and for a devastated Europe and its people. The situation called for trained experts in food and its use—experts who could approach the subject from the standpoint of the food needs of the normal individual as opposed to the hoary idea of specificity of certain foods in the treatment of disease; experts conversant with the broad aspects of food, its production, distribution, preparation, conservation, and consumption.

When this country entered the war in 1917, dietitians who had enrolled with the Red Cross began to be assigned to the Medical Department of the Army or to the Red Cross for overseas service. Others, meanwhile, served at home—notably Mary A. Foley, later assistant professor of medicine (dietetics) and member of the Permanent Staff of the Mayo Clinic; Mary M. Harrington; and Maude Perry among many others. These were the women who built the groundwork of belief in the dietitian and her ability which opened the way for those who did heroic and devoted service in World War II, and for the dietitians now serving in the Veterans Administration and the U. S. Public Health Service.

Still others served under the auspices of the Food Administration in World War I with "Food will win the war" as their slogan. Gardens flourished; there were meatless and wheatless days and substitute cereals for wheat; canning kitchens were opened; and fresh and dried fruits took the place of scarce, sugar-sweetened desserts. Shortages in staple foods centered the public mind on the more perishable fruits and vegetables, as well as milk, of which they had used too little. Consumer demand for McCollum's protective foods was thus stimulated by need—and by education. The stomach, the "power house" of the body, for more reasons than one began to be the deep concern of every human being.

Relatively few uncertainties perplexed the mind of the dietitian of that period, such as the interrelationship of the vitamins and hormones or the essentiality or non-essentiality of the amino acids. She knew how to cook. She knew people had to be fed, and she believed she was equipped to do it better than anyone else. It was a period when the dietitian made her own opportunities, instead of merely fitting herself for those that might be waiting. It was only a matter of adherence to the six categories of her faith: purchasing, preparation, conservation, sanitation, serving, and utilization. Perhaps the very assurance of this World War I dietitian in her simple creed gave her the courage and enthusiasm to advance.

THE AMERICAN DIETETIC ASSOCIATION IS FOUNDED

Again the stage was set for a dramatic and far-reaching advance. In 1917 the call went out "for dietitians of the country to come together in conference." With Lenna F. Cooper and Lulu G. Graves as leaders of the movement, the preamble to this first and historic "Dietitians' Conference" reads in part as follows:

> Now that our national crisis requires conservation on every hand, it seems highly important that the feeding of as many people as possible be placed in the hands of women who are trained and especially fitted to feed them in the best possible manner.
>
> This conference of dietitians promises to be a most important one: first, for the dietitians who come together to discuss the food problems of the day; second, for the hospitals and institutions with which they are affiliated.

[2] A *dietitian* is one who has had college training in the science of nutrition and management, and is proficient in the art of feeding individuals or groups.

A *nutritionist* is one who has had college training in the science of nutrition and is engaged in interpreting the principles of nutrition to individuals or groups.—*Approved by the Executive Board of the American Dietetic Association in October, 1940,*

A total of ninety-eight dietitians attended this first meeting at the Hollenden Hotel, Cleveland, October 18–20, 1917. On October 20, with Miss Cooper in the chair, Annie L. Laird moved that a national association, to be known as the American Dietetic Association, be formed.[3] Miss Laird was later professor of household science at the University of Toronto and honorary president of the Canadian Dietetic Association. The fifty-eight charter members of this new national organization elected Miss Graves as president and Miss Cooper as first vice-president. And there were four exhibitors at this meeting!

Interesting, too, is the fact that while the East had seemed to be leading, now the Middle West came to the fore. The program included a paper on the "Vitamines" by Amy Daniels of the University of Wisconsin; "Infant Feeding" by Ruth Wheeler from the University of Illinois; "The Dietitian and Her Equipment" by Louise Pollock, City Hospital, Saint Louis; and "The Dietitian as the Doctor's Assistant" by Miss Graves, then at Lakeside Hospital, Cleveland. Miss Cooper, then at Battle Creek Sanitarium, led a round table on "Food Conservation" and Mabel Little, director of University Dining Hall, Cornell University, and one of a lone duet of Easterners on the program spoke on "Economical Buying." The other was Elva A. George, then with the Red Cross in Washington, who spoke on "The Red Cross Dietitian." The late Rena Eckman, then working on her master's degree at Teachers College, was unable to attend in person because of the demands of her research work, but sent a paper which was read at this first meeting. Miss Eckman was the first dietitian distinguished by collaboration with a physician in writing a book, *The Starvation Treatment of Diabetes Mellitus*. (It will be recalled that this was the pre-insulin period, with the washed bran wafer and the thrice-boiled vegetable basic items for the diabetic.

[3] J. Am. Dietet. A. 14: 752, 1938.

Among these notable women was one who deserves special mention in the annals of the Association, Dr. Ruth Wheeler. A great teacher and leader, she was the first to teach that the therapeutic diet should be based on the normal needs of the individual, a concept that was to revise drastically the diet therapy of all conditions amenable to it. It was during her term of office as president that this JOURNAL, the official publication of the Association, was founded.

When one seeks the source of group action or mass movements, the search always narrows down. Always the few provide the momentum for the advance. Those who planned the first Dietitians' Conference, Lenna Cooper and Lulu Graves, together share the honor of having founded the American Dietetic Association. To them and to their associates in that small group of pioneers we are forever indebted. They truly set an example of service, of devotion to duty, truth, and honor—those eternal human verities. To others so equipped, the way is always open to advance.

Many of us will recall the wise council she has had from Miss Graves or Miss Cooper. They always had time to see the young and inexperienced dietitian—they were never too busy, never believed themselves too important. Among the group were many others who were inspired leaders and teachers, women who were to contribute mightily to this new profession—Amy Daniels, Katherine Fisher, Margaret Sawyer, E. M. Geraghty, Emma Smedley, Violet Ryley, and Maude Perry, to mention but a few.

Theirs was a story of accomplishment, of opening up new vistas of opportunity for others who were to follow. Nearly all of them were to see their small group of fifty-eight grow to a present membership of nearly 8000, an organization with national and international repute whose expected attendance at the Thirtieth Annual Meeting will demand the facilities of Philadelphia's Convention Hall.

English Definitions

With due regard for logical procedures, the new publication *Nutrition, Dietetics, Catering*, which will carry official news of the British Dietetic Association and of the Food Education Society, defines in its first issue the meanings of the terms used in the title. These definitions are of particular interest to the members of the American Dietetic Association who have worked strenuously on these same terms. We quote:

"In our view, the human *nutritionist* works on the basic problems involved in the needs of the human being for food and the ways of meeting these needs—and this would seem to include appropriately the workers in public health nutrition and in nutrition education: the *dietitian* applies the findings of the basic science of nutrition to the feeding of human beings in health and disease, and may or may not be involved in the actual handling and service of food: the *caterer* applies the principles of nutrition through the buying and storage of foods, the planning of well-balanced menus, the cooking and service of meals, the planning of kitchens and dining-rooms, the buying and care of equipment, the control of staff, and finally, though by no means of least importance, the maintenance of hygienic conditions wherever foods or food utensils are handled. That these three types of individual need not in every case be distinct is clear: that in all cases there is room and urgent need for the closest of mutual collaboration, both in research and application, is very obvious. It is one of the aims of this journal to increase the possibility of such collaboration."

Factors Influencing Food Acceptance[1]

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FULL application of the knowledge in nutrition awaits a better understanding of the reasons why people eat as they do. Acceptance of food is a complex reaction determined by the biochemical conditions of the body, the response of the sense organs, and the mental state of the individual. The latter, in turn, is influenced by social, economic, and environmental conditions, coupled with the past experience of the individual. It has been said that food with man is not just food; it is the crossroads of emotion, religion, tradition, and habit.

Progress in this field demands the full mobilization of scientific, cultural, and educational resources. The contributions of chemistry, physiology, bacteriology, physics, and histology have made possible the rapid accumulation of knowledge in foods and nutrition. These sciences have provided new methods of investigation, more information about the nutrients, the needs of the body, and its response to different dietary regimens. In the application of this knowledge for the welfare of mankind, psychology, sociology, economics, history, and education have equally significant contributions to make.

It is the purpose of this paper to review briefly some of the biochemical, physiological, psychological, social, economic, and educational aspects of food acceptance and food habits.

BIOCHEMICAL ASPECTS

The extent to which the selection of food is influenced by the chemical state of the body is not known. Hunger, the most basic drive for food, has long been associated with the contractions of the empty stomach. These, in turn, may be initiated by the level of various substances in the blood. Glucose has been mentioned in this connection, and more recently it has been suggested that hormones are involved. It has been shown that when the blood of a starving dog is tranfused into a normal dog, typical hunger contractions are induced in the normal dog in 10 to 30 min. Conversely, when the blood of a recently fed dog is transfused into a starving dog, the stomach contractions of the starving dog are abolished for a period of 5 to 6 hr. Williams states that there may be not only a hunger hormone but also a satiation hormone which works in an opposite direction (1). Hunger and appetite are different phenomena. The latter is more differentiating than the former, and may, therefore, be a factor of greater importance in the general problem of food acceptance. That the appetite of rats may be related to physiologic requirements has been demonstrated by Richter and his associates (2–4). Rats subjected to conditions which profoundly disturbed their metabolic process showed a marked ability to select the substances needed. Thus adrenalectomy led to increase in appetite for sodium salts, parathyroidectomy to increased appetite for calcium salts, and pancreatectomy to the consumption of a diet high in fat, low in carbohydrate, and with variable proportions of protein.

Except for occasional observations in the clinic, such relationships have not been observed with human beings. Richter has reported several cases of Addison's disease in which the patients had an abnormal appetite for salt with dislike, approaching aversion, for sweets. Moreover, it has been noted that in the pre-insulin days, the preferences of diabetic patients were similar to those of pancreatectomized rats. Fat often formed the bulk of the diet, and on these diets patients frequently were maintained satisfactorily.

Starved or semi-starved people generally appear interested in any kind of food. The filling of the stomach is of major importance. In fact, under these circumstances, substances commonly disgusting or nutritionally valueless often satisfy. From the metabolic standpoint, calories are apparently the main urge to the hungry person.

Macy has observed an abnormal craving for sweets in children whose dietaries are poor. As the diets are adjusted to meet the bodily needs, the healthy child voluntarily reduces his sugar consumption (5).

Pregnancy produces marked changes in metabolic processes and nutritional needs. Richter observed that when allowed to select food from feeders containing olive oil, casein, yeast, sucrose, wheat germ

[1] Received for publication April 4, 1947.

oil, and a variety of salt solutions, pregnant rats tend to increase all individual food intakes but sucrose and yeast. Darby, from studies of the dietaries of pregnant women in the Tennessee-North Carolina area, reported that they tend to increase their intakes of calories only (6).

Metabolic needs may play a fundamental role in nutrient selection. How, then, is nutrient selection influenced by the variety of flavors, textures, and odors which accompany these substances as they occur in natural foods? In human nutrition, the problem is very complex.

PHYSIOLOGICAL ASPECTS

Physiological considerations are closely intermingled with the chemical and the psychological. Future developments may largely erase the differences. Regardless of the dividing lines, the nutritionist and the dietitian may gain useful information from a study of the nature of sensations and the possible influence of physiological state on reactions to food.

In his book, *The Origin of Food Habits*, Renner discussed the sensory perceptions of food (7).

People differ in the intensity of their taste sensations. That is to say, the relation between the amount of a substance and the intensity of sensation varies from one individual to another. Some are keen-sensed; others, dull. The former are generally the quickest eaters. But, according to Renner, the majority of people are of the dull-sensed variety—an interesting observation when considered in relation to the prevalence of poor eaters, and the tendency to desire strong seasonings, pickles, and other food accessories.

Individual variations in the sense of taste have also been stressed by Williams, who summarized several studies on this subject (1). In one instance, the taste thresholds of forty-seven individuals to sixteen substances were noted. Wide variations were observed. For one individual saccharine was only thirty-two times as sweet as sugar; for another it was 2000 times as sweet. For one subject quinine was 256 times as bitter as cascara; for another, cascara was two times as bitter as quinine. One person was unable to differentiate between the tastes of quinine and of hydrochloric acid. One substance, phenylthiocarbamide, given to 6377 people by Blakeslee, as cited by Williams, was pronounced tasteless by 20.3 per cent, bitter by 65.4 per cent, sour by 5.4 per cent, sweet by 2.1 per cent, and salt by 4.8 per cent. One and nine-tenths per cent ascribed other tastes as "astringent, like lemon, like rhubarb, like cranberries, or like vinegar."

There seems to be no accounting for people's tastes. Moreover, the taste threshold of the same individual varies from time to time. Williams suggests that this appears to respond to accompanying changes in internal physiology (1).

Equally important from the standpoint of food acceptance is the ease with which the sense organs are fatigued or dulled. The continuous sniffing of bread from 1 to 4 min. is sufficient for most people to lose their perception of it; but, here again, people differ in the rate of response. Food loses much of its challenge when we cease to register perceptions of it. Dawdling with meals may be related to this phenomenon. The practice of requiring children to sit with a plate of food under their noses for an interminable period of time seems ill-advised. A revival of interest in the food is improbable, and unpleasant associations with it may result in a permanent dislike for it.

Interest in food may be sustained by protection of the sense organs against fatigue. Alternating strongly flavored foods, such as meat, with mild ones, such as bread and potatoes, is effective. The enjoyment of eating is prolonged by this procedure. Difficulties in the acceptance of strong flavored foods may be explained partly on this basis. In a study of the acceptability of foods served in the school lunch to children in a West Texas school, cabbage slaw was observed to be the least popular of all salads served. Its acceptability was increased by the addition of milder substances, notably apples (8).

The extreme sensitivity to textural differences is another factor to be considered in the acceptance of food. From early times people have desired smooth food. The pestle and mortar was an ever-present piece of equipment in the kitchens of ancient times. Today many gadgets have been devised to produce textural improvements—the meat chopper, the electric mixer, and the Waring Blendor. Manufacturers spend large amounts of money to produce smooth, creamy textures. Undesirable reactions to food are often brought about by unpleasant particles left between the teeth, scratchy sensations produced by slight roughness in the food, and the skins, to some people, may be actually nauseating; but, here again, people differ in their sensitivity. Individual differences, particularly as regards the sensory reactions, must be taken into consideration if we try to understand the food likes and dislikes of different people.

The influence of age on food acceptability has been associated with physiological changes in the taste buds. Laird and Breen have pointed out that there is a gradual disappearance of taste buds throughout life (9). Taste buds, abundant in early childhood inside the cheeks and in the throat, disappear during adolescence until chiefly those of the tongue remain. In adulthood little change takes place until later years, when there is again a decline both in structure and function of the buds. These physiological changes may help to explain changes in attitudes toward food, as the individual passes from childhood to old age. The child may, indeed, have taste sensations very different from those experienced by

older people with the same food. The experimental work of these investigators indicates that the youthful disappearance of taste buds from the cheeks and throat is completed by the twelfth year. With older people, these workers also observed a noticeable shifting with age of taste preference, around what may be called a "neutral pivot." The preferences for sweets declined while the preference for a "tart, fruity" taste increased. The taste preferences of women were greater than those of men for the tart flavors and less for the sweet; moreover, they inclined in the direction of those of the aging group. These authors comment, "Age apparently becomes sour in taste, if not in disposition."

Does the male differ from the female in its reaction to foods? With rats, Scott and Quint observed no differences attributable to sex when diets with several flavors were given (10). The results of human experiments differ. It must be remembered that most of the human studies deal with attitudes and not behavior, since usually they are based on responses to check lists. Hall and Hall made an analysis of food likes and dislikes of 693 students (215 men and 478 women) in western universities (11). A check list of 150 foods was used. Significant sex differences existed in food aversions with respect to seventeen foods. The women were found to have more food aversions than the men, but the women were familiar with more foods.

Similarly, Wallen, in 1943, prepared a list of 143 foods which was presented to 308 women and 237 men (12). Comparisons between the sexes led to the conclusion that considerable uniformity existed in the foods disliked; for a small proportion of items, however, reliable differences existed in the extent to which males and females reported aversions. In most cases where sex differences occurred, a larger proportion of females than of males disliked the food. This investigator suggested that these differences may be associated with social pressures operating in the early years of life. Little boys are expected to refrain from tears, stand discomfort "like a man," and refuse to shrink from new experiences. Little girls' reactions, on the other hand, are viewed with a more "permissive attitude"; the tendency to discourage timidity is less pronounced. Internal organs are highly unpopular, and foods conspicuously disliked by all groups were buttermilk, brains, Limburger cheese, pig's feet, tripe, and kidney. Foods for which few people had aversions were orangeade, lettuce, grapes, pears, and plums.

Combining age and sex, McCluney studied the food likes and dislikes of 250 persons in a Texas community (13). Her subjects were grouped as follows: twenty-five males, and twenty-five females from fifth grade, eighth grade, high school, college, and adults. In each group except the eighth grade, the dislikes of the females exceeded those of the males. For both males and females dislikes were conspicuously numerous among the eighth grade children. This observation is of interest in connection with the previously mentioned change in taste buds at the age of twelve. At all ages only a small proportion of the foods was merely accepted; they were either liked or disliked. Although the list was composed of fairly common foods, 175 in all, a surprisingly large percentage was unfamiliar. Foods unknown to the largest number of subjects were found among the green and yellow vegetables and the meats. This and other studies suggest that with many people, the range of familiarity with foods is limited.

PSYCHOLOGICAL ASPECTS

The psychological aspects of food acceptance represent an area in which much information is needed.

Graubard (14) has said, "Food lies more in the realm of psychology than in the sphere of biology, or even of economics." The establishment of sound food habits, according to him, implies some knowledge of the psychology of eating, the past record of man's attitude toward food, and the social factors influencing the choice of food. Continuing, he added, "Repeating nutritional truths without regard for these forces is like singing of spring in the dark of a winter storm and expecting flowers to blossom forth on the spot." The "meaning" of food is a quality stressed by the psychologist (15, 16). Boston baked beans, "pot licker," gumbo, spoon cornbread, hush puppies, hot dogs, and candy canes possess an appeal for certain groups far beyond that which may be accounted for by the intrinsic merits of the food. Memory and association increase the lure of holiday food, camp cookery, and the pies which mother used to make. The ambitious dietitian may indeed ask if an equally significant "meaning" could be attached to the food she serves, whether it is the school lunch, the Army mess, the hospital tray, or the meal in the college dining hall. The answer may be "yes," provided she keeps constantly before her the importance of the quality of the food, the environment, and the state of the individual at the time of eating. At any rate, as group eating increases, it becomes of greater importance to appreciate the conditions by which food acquires favorable significance in the minds of the people who eat them.

Memory and association are important factors in the reaction to food. Here is an entertaining example found by Renner (7) among Booth Tarkington's characters:

"Aged ten, returning famished from skating, I found in the pantry four full-sized pumpkin pies unattended. Morally undermined, I ate all the first pie. Fairly excited, I ate the second pie. Happy, I could not give up the remaining two and began the third. Enthusiasm departed, but out of a sense of

duty to myself I ate all the third pie and a section of the fourth before creeping illness seized me."

Fortunately, memory of food is not accurate. Gradual changes are often not detected. Producers use this principle in altering the constituents of manufactured foods. Dietitians and homemakers, too, could use it to advantage. In a complex of sensations, one single unpleasant sensation may result in the entire group becoming unpleasant. The scratchiness of whole wheat bread is probably a factor which has complicated its acceptance (7).

Contradictions characterize the psychological reactions to food. For example, monotony in food is a frequent cause for discontent. "Something different" is a constant cry both of homemakers and dietitians. Ventures in eating new dishes are welcomed—even sought. Yet, in general, people are reluctant to change their accustomed ways of eating, particularly as they relate to mainstays of the diet, such as bread, meat, and potatoes. This principle has been variously expressed: "That to which we are accustomed seems natural, while the strange seems unnatural and undesirable" and "We like what we eat, rather than eat what we like." An old German proverb states, "What the peasant does not know, he does not eat." G. I. Joe, it is stated, did not go in for new taste sensations.

Thus, the fellow from Mississippi complained that it was a pretty sorry meal when you did not get rice or grits along with your potatoes. The young man from Tennessee wanted to know just how you could get along without some sort of hot bread to stick to your ribs, and the "gripe" of the North Carolinian was that he had never yet tasted vegetables which were not cooked with a ham hock or salt pork and he wasn't going to start now. Probably in most instances the men finally became accustomed to the Army food. In many cases they may have actually preferred it to their previous diet. The length of time required to become adjusted to a new diet is another problem of interest. With rats, previous diet seems to affect selection only during the first one or two days of the experimental period (10). The equivalent in human experience would be thirty to sixty days.

Food aversions have varied origins. Working with a group of nursery school children, McCarthy observed that 35 per cent of the aversions could be traced to food dislikes on the part of members of the family (17). A much higher percentage of identical aversions occurred between siblings than between children and parents. Interestingly enough, with rats Scott has noted that litter mates tend to have similar appetites when allowed to choose freely from containers of sucrose, casein, hydrogenated fats, and salts. The observation is interpreted to indicate a possible influence of hereditary factors on choice of food (18).

With a group of nursery school children in London, Duncker noted a considerable tendency for children past the age of two and two thirds years to follow others in their selection of foods in a test situation with six different foods (15). The young child followed the example of the older child more often than the reverse. The tendency was pronounced when a high degree of friendship existed between the two children being observed. Imitation of adults in the selection of food by the children was not marked. The author stated that respect can act as a wall.

Mental state has an important bearing on food selection. The direct relationship between neurotic tendencies and food aversions has been recently shown by Wallen (19) and Gough (20), both of whom had available for study men discharged from the military service because of inaptitude, or selected from the neuropsychiatric section of the station hospital. On the basis of data previously collected, a list of twenty foods was prepared which reflected the incidence of food aversions, highly correlated with that detected by a longer list containing approximately 150 foods. Table 1 shows the results obtained by Wallen for the normal and neurotic groups.

TABLE 1

*Food aversions of neurotic and normal males**

SUBJECT	NUMBER	MEDIAN AGE	EDUCATION	AVERSIONS
		yr.	*grade completed*	
Group 1				
Neurotic	50	25.0	8.4	3.5
Normal	100	18.9	11.1	0.7
Group 2				
Neurotic	45	27.1	10.2	3.3
Normal	114	26.1	8.9	0.9

* As reported by Wallen (19).

Using the same list of foods, with 254 normal and 79 neurotic male soldiers, Gough found the average number of dislikes for neurotics to be 5.14 and for normal persons, 1.23. The difference was significant.

The neurotics especially disliked grapefruit juice, cabbage, bean soup, and potato soup; but in general the pattern of dislikes was much the same for neurotic and normal individuals. The former were prone to have unpleasant associations with food. To test this point, 103 randomly selected recruits were asked if they could name at least one food they disliked, and if this dislike was associated with anything unpleasant or disgusting. Fifty per cent named a food, but only seven could give a disgusting association. Of the twenty-two neurotics, eighteen, or 82 per cent, mentioned one or more foods disliked. Of these, seven mentioned disgusting associations, and two more had nauseous reactions without associated ideas. "Neurotics apparently have peculiar ways of thinking which emphasize the unpleasant

and the disgusting." The relationship between neurotic tendencies and food aversions in this study was so marked that the author suggested a list of twenty foods which might be used in tests for the detection of maladjusted people.

Since mental stability is a quality desired by most people, these findings lend strength to the cause of food acceptance. According to Townsend, "The educated cosmopolite does not hesitate to try strange foods. Not so, the savage, the child, and the ignorant. In these three classes, food prejudices—often curious and irrational—abound" (21).

The psychology of eating is indeed difficult to understand. On the one hand neurotic states lead to rejection of food; on the other, excessive eating has been associated with disturbed mental states. According to Freed, psychiatrists have long known that eating is an emotional outlet and may be under the influence of the subconscious mind (22).

He also stated that anything which increases the emotional tonus, such as sorrow, nervousness, irritability, or anxiety, may further the desire for food to the point of causing increase in weight. To investigate this point he asked the following question of 500 consecutive patients who requested treatment for their overweight: "When you are nervous or worried, do you eat more or less?" Three hundred seventy said they ate larger meals, or more frequently; ninety-five said that they did not believe they ate more when they were nervous and worried, but they did eat more when idle or bored. Overeating seems often to be associated with increased nervous tension. Premenstrual tension, according to Freed, may lead to increased eating, and puberty and pregnancy are conditions which commonly precipitate overeating through the development of anxieties, fears, and new drives. Frustration, overcompensation, and lack of emotional satisfaction are subconscious patterns which often result in overeating.

SOCIAL ASPECTS

Group influences play an important part in attitudes toward food (23).

Of these, one of the strongest is race. Rubner observed that an emigrant tends to forget the language of his fatherland before giving up his native food habits. Ultimately a melting pot of people of different nationalities results in a fusion of food habits and customs. For centuries, Bohemians, Moravians, Poles, Hungarians, and the Yugoslovians flocked to Vienna. All tried to keep their native food habits, but finally they blended to form the famous Viennese cookery, which bears the characteristics of each contributing people (7).

A similar situation today may be observed in Hawaii, the melting pot of the Orient and the Occident. The taro and sweet potato of the Polynesians, the fruits, vegetables, and the seaweed of the Filipino, the soy products of the Chinese and Japanese, and the garlic and pepper of the Koreans are all being blended with the coffee, candy, soft drinks, and tobacco of the Americans! In spite of this, the Hawaiians are reported to be making a conscious effort to assimilate the best that each people has to contribute (24).

Racial background has been observed by Mack to present one of the most frequent obstacles militating against change in dietary habits (25). As might be expected, children from parents of two national origins tended to have a wider variety of foods and to give better responses to nutrition tests than those whose parents were of the same extraction. The highest overall ranking was that of children of German mothers and Irish fathers. In approved dietary practices they surpassed the children of Irish mothers and German fathers as well as those whose parents were either both Irish or both German.

Mack has also shown that attempts to cling to traditional food habits in a new land with extremely different foods on the market may result in malnutrition. In this instance her observations were made on seventy-three Chinese children in Philadelphia. On the average, polished rice comprised about one fifth of the day's dietary. Many of the individual meals were composed of this food to the extent of three fourths their total weight. "Once a rice eater always a rice eater." The vegetables most extensively used were those similar to the ones found in South China. When these were not available, the diets suffered. The dietary pattern was described as a fragmentary remnant of the middle class Chinese in South China. It had been modified with hot dogs, soft drinks, "popsicles," pretzels, chocolate bars, and other snack foods which the Chinese children had seen the American children eating on the streets.

The variations in the patterns of human dietaries are innumerable. The recent summary of the world food supply in 1939, made by the Food and Agriculture Organization, indicates the extremes which may be found among the seventy different nations studied (26). These are shown in Table 2.

Geographical conditions are determining factors in the type of foods people eat; yet, Denmark and New Zealand, located on opposite sides of the earth, have similar diets, as indicated by their food supply.

Economic conditions exert an important influence in the selection of food. Money is uppermost in the minds of most homemakers as they purchase food for their families (27). High cereal and potato consumption characterizes the diets of the countries with lower economic status. Decreasing the cost of a food is an important way of increasing its consumption.

Technological advancements, too, exert a far-reaching influence on food habits. Visualize the changes which would take place in food habits, if

TABLE 2

*Prewar food supplies grouped according to contrasting availability**

FOOD GROUP	SCARCE SUPPLY		PLENTIFUL SUPPLY	
	Country	Kg. per caput per year	Country	Kg. per caput per year
Milk	China	—	Sweden	341
	Formosa	½	Switzerland	320
	Korea	3	Finland	280
Cereals	Paraguay	58	Bulgaria	226
	Kenya-Uganda	60	Yugoslavia	224
	Costa Rica	74	Rumania	216
Roots and tubers	Iran	—	Kenya-Uganda	464
	Trans-Jordan	—	Poland	275
	Iraq	½	Paraguay	252
Meat	India	8	Australia	134
	Java and Madura	8	Uruguay	132
	Manchuria	10	Argentina	129
Fruits and vegetables	Peru	20	United States	203
	Kenya-Uganda	25	Brazil	202
	Cuba	28	El Salvador	201
Pulses	Eire	2	Ceylon	63
	Austria	2	Turkey	30
	Australia	2	Manchuria	30
	French Morocco	2		
	Germany	2		
	Denmark	2		
	Iceland	2		
Fats	Iran	1	Denmark	26
	Iraq	1	Norway	25
	Trans-Jordan	1	Netherlands	23
	Union of South Africa	1		
Sugar	China	1	Denmark	55
	Korea	1	Australia	53
	French West Africa	1	United Kingdom	50
	Madagascar	1		

* As reported in World Food Survey (26).

milk solids or dehydrated eggs could be reconstituted to form products indistinguishable from the fresh.

Developments in freezing undoubtedly have promoted the year-round use of vegetables, just as the widespread use of pineapple awaited the introduction of canning. Improvements in refrigeration and the development of refrigerated cars were partly responsible for the threefold increase in the use of citrus fruits in the last forty years (28).

Transportation also enters into the picture. The development of highways has facilitated the distribution and hence the use of milk. Air transportation may be expected to leave its imprint on food habits. With the gardens of Texas, California, Florida, and South America only a few hours flying time from any point in the United States, the markets of the country are likely to take on a different appearance. Actually, many of the fairly familiar foods may gain greater acceptability due to the fact that they reach the consumer in a more appetizing state. It has been said that many people in the United States are unfamiliar with the flavor of tomatoes or grapes just off the vine.

Increased communications between countries and between parts of our own country may be expected slowly to eliminate regional dietary differences. Folkways in eating may conceivably disappear. World food planning and the goal of good nutrition for all may also contribute to greater uniformity in eating habits. The effect of these forces on world-wide food habits and customs is an interesting reflection. Renner suggests that internationalism of cooking should begin with uniform standards of salting, but that this alone would be enough to throw the whole world into a state of misery, possibly for generations.

EDUCATIONAL ASPECTS

The problem of changing food habits is complicated and imperfectly understood. Actually food habits are constantly in process of change. For example, in the United States the consumption of citrus fruits has increased 350 per cent since 1909. We are eating 30 per cent less potatoes and grain products than in 1909. The consumption of milk products has increased from 169 qt. per caput in 1909 to about 257 in 1945 (29). Deliberate attempts, however, to change food habits often meet with strong resistance. Examples are the difficulty which has been encountered in increasing the use of whole wheat bread and in introducing the soybean into the human dietary.

The attitude of people toward health and food is difficult to understand. The public is health-minded. It is apparently convinced that certain constituents of foods, the vitamins in particular, promote health. People spend millions of dollars for vitamins in the form of pills; a recent study showed that approximately one half of 900 people surveyed used some kind of vitamin pills. Next to money, health was the most important consideration in the selection of food by 107 Iowa homemakers studied by Lewin (27). Nevertheless, urging greater use of certain foods because of their health-giving properties seems not to make a popular appeal. In fact, people often appear to take a strange delight in eating that which is "not good for them." While seeking health, they love their ailments and guard as an inalienable right the privilege of eating what

they wish, regardless of the consequences to themselves and to society.

Nutritionists may learn much about the problems involved in introducing a food not commonly used, as the soybean, from the story of the potato which was brought to Europe from America in the sixteenth century. In many respects the problem is very similar. The potato was widely used in American countries, just as today the soybean is a mainstay in the Orient. It was apparent that the potato could be of great value in alleviating the famines which invariably followed crop failures in Europe, just as today it is recognized that the soybean can contribute much to our protein needs in times of meat scarcity, rationing, and prohibitive prices. The establishment of the potato in Europe required 250 years. Reactions to it in the seventeenth century were very similar to our own reactions to the soybean in this enlightened age; it was considered fit only for animal food (14).

Techniques to hasten the acceptance of the potato were many and varied. The London Royal Society advocated its cultivation to avoid mass starvation in case of crop failure. This brought no response. Preachers rendered sermons on the "lowly tuber" with the result that in Germany a group of these enthusiasts were called "potato preachers." These efforts also were ineffective. People claimed that potatoes poisoned the ground and caused diarrhea; they preferred to starve rather than to use them (14).

The prestige procedure was also tried. In France an effort was made to secure their acceptance by way of royal approval. Potato blossoms were worn by Louis XVI in his lapel and by Marie Antoinette in her hair. The landed gentry grew potatoes in their gardens. These methods failed. The "forbidden-fruit technique," cleverly planned by Parmentier, a French apothecary, proved more successful. By way of suggesting the use of potatoes to the poorer people, he proclaimed loudly in the streets that the pillaging of the gardens of the barons for potatoes was a punishable offense. The story goes that the pillaging promptly began, and it wasn't long until the gardens of the poorer people contained potatoes (14).

Of the various procedures used for the introduction of potatoes, group feeding was the most successful. Count Rumford, otherwise known as Benjamin Thompson, a Royalist born in the United States, left this country in 1776 and in the course of time became the military adviser of the Duke of Bavaria. After studying the condition of the local farmers, he became convinced that if they would abandon their resistance to potatoes, they would have something to eat when their crops failed. He tried persuasion and demonstration, but to little avail. At last he devised the plan of making every soldier of the Duke's forces plant a patch of potatoes, care for it, and eat the potatoes. Since the duration of military service in those days was fairly long, the men had time to develop a taste for them. The end of the story is that after the soldiers returned to their homes, potato crops appeared all over the country, and the people of Europe gained greater insurance against famine (14).

Group feeding today offers one of the best opportunities to promote better food habits. An estimated 20 per cent of the meals are taken outside the home (30). Public eating places, the school lunch, the college dining hall, and the Army mess are focal points for the improvement of the food habits.

The results of educational programs in nutrition have scarcely been proportional to the efforts expended. The field of nutrition has much to offer for the improvement of mankind. There is enough knowledge now available to produce a superior race of people if we only put it into practice. Application, however, lags far behind the progress of the science. At this point the evaluation of methods may be as important as accumulating knowledge.

According to Stone (31), we need to sharpen our tools. Writing on the subject of how to get the most out of health education tools, he said in effect; first, know what you want to teach, and second, whom you wish to reach. Then "light a fire, build a bridge, get down to cases, and ask for action." In other words, create an interest, bridge the gap from interest to goal, illustrate with actual cases, and don't leave your public saying "so what!" "Ask for action in clear, certain, definite terms."

For several years educators have been preaching a doctrine of democratic procedure in education as well as in government. Scientists too often have been reluctant to adopt the former. When education is to be followed by action, as in the change of food habits or the acceptance of food, it seems reasonable that little can be accomplished without the active participation of the people involved.

The superiority of "group decision" over "lecture-demonstration method" was demonstrated at the University of Iowa (27). First an effort was made to obtain greater consumption of whole wheat bread in boys' dormitories. A careful account was kept of the consumption of white and whole wheat bread for a week preceding the experimental situation. Then the dormitories were divided into two groups: one in which was presented a well-worded request that the boys use more whole wheat bread; the other in which a statement concerning the situation and the need for improvement was made and discussion held. In the end, this group was asked to decide whether or not they should make an effort to increase their use of this food, and if so, to set their goals. The boys decided that they should eat more whole wheat bread. During the following week the intake of bread was observed in all situations. The superiority of the group decision technique was apparent. All the goals were not attained, particularly those which, in a burst of enthusiasm, were

set too high. Yet the group decision technique was decidedly more successful than the request procedure.

In the same series of investigations, methods for increasing the use of organ meats with homemakers were tested. Six groups of thirteen members each were used. These groups were divided into three pairs, largely on the basis of three economic levels. The same nutritionist worked with all groups. With three of the groups, one on each level, the nutritionist gave a well-planned lecture and demonstration. With the remaining groups, as nearly comparable as possible, a member of the group took charge, presented the question, and led the discussion. The nutritionist was consulted as questions arose which needed the opinion of an expert. Illustrative materials were used as they pertained to the discussion. In the end, the members of these groups voted to try the organ meats.

After seven days, all the homemakers were visited for the purpose of finding the extent to which the organ meats were used after the meetings. Results revealed that they were served at least once by only four out of forty-one participants of the lecture group. In contrast they had been used by twenty-three of the forty-four participants of the other group. In other words, lectures led to action by 10 per cent of the participants; group decision brought response by 52 per cent. In the latter case, 23 per cent of the women served a food they had never used before, whereas in the former, the corresponding percentage was 3.

Nutrition education in the past has been too general, according to Pett (32). He stated that it has consisted of a "shotgun" or "blunder buss" approach. According to him, we have dealt too much in "national averages" and too little with individual situations. It is wrong to suppose that everyone must drink more milk, just because the national average needs to be increased. We need a new viewpoint, a new method of attack. This new method must be a community approach based on a definite knowledge of conditions in the community and carried into effect by the people of the community.

Ideally the approach described by Pett is based on nutritional appraisal of the specific group involved. This step will take the guesswork out of the problem to be faced. Methods for nutritional appraisal are as yet not well developed; it seems improbable that mass studies in nutritional status of people of the United States will become nationwide for sometime yet. In the meantime, much can be gained by rapid surveys of the food which people eat. This, after all, is the cornerstone of good nutrition and must be the basis for revitalizing procedures for nutrition education.

Efforts to change food habits of people should be accompanied by certain precautions. Due respect must be given the habits and customs which have led to survival of the species. There are many gaps in our present day knowledge of the constituents of the perfect diet; studies of the food habits of other peoples should be undertaken with intent to learn as well as to reform.

It is also important to remember that food habits are complex; few foods are consumed as isolated units. Our diets are full of interrelationships, for example, bread and butter; meat, potatoes, and gravy; cake and ice cream; sugar and cream with coffee. The intake of any one food is likely to influence the intake of other foods. Dickins has said, "A given diet is an intricate, interrelated combination of foods in which an increase or decrease in the consumption of any one element not only affects the balance of the diet in terms of the contributions made by that particular food, but may also increase or decrease the consumption of related foods." Observations of the effects of a white cornmeal shortage in the diets of Mississippi children illustrated her point (33). Without the customary white cornbread, the children preferred less of the green vegetables, buttermilk, beans, and peas. With biscuits, they preferred such foods as sirup and gravy. Interestingly enough, with yellow cornmeal, they preferred the foods desired with biscuits, namely, gravy and sirup. The ultimate benefits derived from the substitution of yellow cornmeal for white may, indeed, be critically viewed.

Food habits play a major part in determining whether or not the newer knowledge of nutrition will find application. As stated by Graubard, "The quest for good nutrition must be a people's movement. It must show didactic and pedantic approaches. It must aim at introducing habits rather than calculations of vitamins and calories, before and after eating. Changes in food habits must be spontaneous and not compulsory. The nature of nutrition education must be such as to give people facts and strength for control of their own habits.

"It must be a people's quest rooted in science rather than in tradition, nurtured by a medley of forces working at random. Once this desire has caught the fancy of the people as did the desire for hygiene seventy years ago, the goal is within reach" (14).

SUMMARY

Food acceptance is a complex reaction influenced by biochemical, physiological, psychological, social, and educational factors. Metabolic conditions play a part. Age, sex, and mental state are factors of importance. People differ greatly in their sensory response to foods.

The food likes and dislikes of the individual move in a framework of race, tradition, economic status, and environmental conditions.

History reveals that changing food habits is usually a slow process. A study of methods which have been employed suggests the value of group feeding as a tool for the improvement of food habits. Educational procedures will gain in effectiveness as they are geared more directly to the needs of the

individual or of the specific community, and as they conform more closely to democratic techniques.

In efforts to change food habits consideration must be given possible unknown factors in the existing diet and the effect of the change on the intake of other foods.

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DISSOLUTION OF SUBSTANCE OF TEETH BY LEMON JUICE

Stafne and Lovestedt report observations on fifty patients who were using lemon juice routinely and who showed evidence of dissolution of dental structure. Thirty-nine of these were women and eleven were men, a ratio of approximately four to one. The patients came from twenty-two states, two Canadian provinces, Mexico, and Puerto Rico; apparently such use of lemon juice is widespread. Striking uniformity was recorded as to the manner in which lemon juice was taken, namely by interval feedings in water. Use of lemon juice in self-treatment was most common among persons who were suffering from rheumatism. The juice was also used for constipation, to prevent and relieve colds, and occasionally as a tonic. When used as a reduction diet, the juice most often replaced entire meals. Most patients were aware of the high vitamin C content of lemons and desired an adequate intake of that vitamin. Defects in enamel produced by action of acid solutions are recognized by rounded margins in contrast to defects produced entirely by mechanical wear, which have sharper margins. The projection of fillings above the surface of the teeth is probably of greatest diagnostic value. These observations emphasize that extensive dissolution of dental structure may occur as a result of drinking lemon juice, particularly if the juice is taken daily and at times other than with meals. An adequate amount of vitamin C can be had without resorting to improper use of lemon juice. In view of its harmful effects on the teeth, the Rochester physicians say that use of lemon juice as a daily drink in any appreciable concentration should be discouraged.—*From Current Comment, J.A.M.A. 133: 1218 (April 19), 1947.*

Comparison of Meat and Legumes in a Controlled Feeding Program[1]

II. Medical, Dental, and Laboratory Observations

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IN PART I of this series of three reports on the relative value of meat and legumes in the feeding of growing children were outlined the initial, the planned, and the average experimental dietaries. In this part of the report, the results of the medical, dental, and laboratory observations and tests are presented. In the concluding installment of the series (Part III) the results of the study will be discussed with especial reference to other published findings in this field.

MEDICAL, DENTAL, AND LABORATORY OBSERVATIONS AND TESTS

The medical, dental, and laboratory observations and tests were made according to the following procedures. Test I was made at the beginning of the study, Test II at the end of eight months, and Test III at the end of the fourteen-month period.

Medical Examinations. A pediatrician examined each child at the beginning and close of the fourteen-month experimental period; a standard routine was used in the examination, and a standard form was employed in recording observations. The examining physician sought particularly for those physical signs and symptoms believed to be related to nutritional status.

Dental Examinations. One trained in anatomy conducted clinical examinations of the teeth and gums, including overall evaluations for orthodontic and hygienic factors at the beginning and at the close of the fourteen-month period. The mouth was charted for decayed, missing, and filled teeth; each standing permanent and deciduous tooth was recorded, as well as any permanent tooth which had been extracted. As a part of the dental examination, X-rays were made of all teeth for purposes of studying the structure of the permanent teeth and of noting carious lesions not observed during the clinical examinations.

A sample of saliva was used to obtain bacterial counts and to find the rate at which dental enamel was dissolved therein according to the procedure of Fosdick (1). These tests were made at each of the three test periods.

Body X-rays. X-rays of the hand, foot, elbow, and knee were made at each of the three test periods. These were used to evaluate skeletal maturation by comparison with the Western Reserve standards, the technique for the hand of which has been described by Todd (2).

The os calcis was used to study mineral density of the skeleton by the method of Mack and associates and described in part by Mack and Smith (3). This technique involves making a photographic tracing of the bone and of a standard ivory ladder X-rayed on the same film, by means of a photoelectric microphotometer; correcting the trace by a mathematical calculation according to the deviation of the ladder trace from that of an ideal ladder trace; and calculating the density of the bone in terms of its equivalent in grams of ivory per cubic centimeter of bone.

Biomicroscopic Examinations. A medical assistant examined the eyes for xerosis of the conjunctiva; the eyes for corneal vascularization; the tongue; the gingiva; and the skin, at each of the three test periods.

A numerical evaluation for *xerosis of the conjunctiva* as seen with the biomicroscope was sought by dividing the eye in twelve zones and recording the most common condition found in scanning each zone (transparency; slight, intermediate, and marked translucency; and opacity). The report is given in terms of average percentage of examined areas exhibiting the designated condition.

Corneal vascularization as seen with the biomicroscope was recorded as to the degree of penetration of capillary loops into different arbitrary concentric zones, and also as to the number of penetrating loops or arcades involved in each eye of each subject.

The *tongue* and *gingiva* (gums) were examined separately with the biomicroscope for old healed lesions and for current acute inflammation of three arbitrary degrees. Only the current acute condition is recorded in this report.

The *skin* was examined biomicroscopically for dryness, for thickening, for so-called keratinization, for keratinization with spines, and for hyperemia. Some research workers object to the term keratinization because this condition, they believe, is associated only with truly epithelial tissues. Nevertheless, in this report, the condition recorded as keratinization, whether used correctly in its absolute sense or not, is that described by Frazier and Hu (4), and described

[1] This study is one of a series of investigations on child feeding carried on cooperatively with the Department of Health, Commonwealth of Pennsylvania. It was assisted by a grant-in-aid from the National Live Stock and Meat Board. Received for publication May 9, 1947.

and pictured by Youmans (5). Youmans used the designation "vitamin A-dermatosis." Some objection may be raised with respect to this nomenclature in that deficiencies other than vitamin A may be operative.

When a dark-colored spine-like plug was seen to arise from the mouth of the hair follicle, the condition was recorded as keratinization with spines.

Blood tests. All blood tests were made at each of the three test periods.

Hemoglobin tests were made by the method of Newcomer (6).

Red cell count observations were made by the method described by Hawk (7), with the addition of the improved Neubauer ruling.

Hematocrit, or the volume of packed cells, was measured by the method of van Allen (8).

Leucocyte and differential cell counts were made by ordinary textbook procedures.

Vitamin A (in blood plasma) was measured by the photometric method of Kimble (9).

Carotene in blood plasma was measured by the method of Kimble (9).

Ascorbic acid in blood plasma was determined by the method of Mindlin and Butler (10) with a slight modification as introduced by Bessey (11).

Total protein in the serum was determined by the falling drop method of Barbour and Hamilton (12), modified by Moore and van Slyke (13), using an instrument constructed by the La Motte Chemical Products Company.

Albumin in the serum was measured by the biuret colorimetric method of Kingsley (14).

Globulin in the serum was calculated by subtracting the albumin from the total protein.

Urinary Tests. *Thiamine* in urine was measured by the procedure of Najjar and Ketron (15).

Riboflavin was determined by the method based on the original work of Ferrebee (16), including modifications by Andrews (17).

Functional Tests. *Heart action* was measured initially and finally by direct examination with a stethoscope, supported by an electrocardiogram. The results of this examination are not included in this report save to record the initial observations.

Reflex observations were made as a part of the routine medical examination.

Observations on the appearance or absence of *fatigue* were made by the medical examiner and assistant during the several hours which each child spent in the clinic. A standardized push-up test also was given to each child at the end of the eight-month period. The technique of Neilson and Cozens (18) was employed.

Dark adaptation tests were made at each test period, using the biophotometer. The data recorded in this report are the results obtained within 20 seconds after a standard exposure to bright light.

No one associated with making observations or tests on these children was aware of the dietary regimen followed with the respective children.

FINDINGS AND OBSERVATIONS

Table I gives a summary of the observations on the body itself, including the results of the physical observations made by the pediatrician and by the dental examiner; the X-ray data; the biomicroscopic findings; and the weight-body build relationships. The first experimental institution (Institution I) received meat (including poultry and fish) twice weekly, with legumes and related vegetable products used in sufficient quantity to give the same nutrients on a calculation basis, as the dietary in the second (Institution II) where meat was served ten times weekly.

Medical Observations on Physical Status. The observations of the medical examiner, supported by the biomicroscopic findings, the X-rays, and the body build measurements show a general improvement in the children of both institutions, with differences between the two institutions in some respects.

Eyes. By gross examination, 9.8 per cent of the children in Institution I and 6.8 per cent in Institution II were observed initially to have an infection of the conjunctiva, and 6.6 and 3.4 respectively an infection of the sclera. At the end of the fourteen-month period, no ocular infections were seen.

The biomicroscopic examination showed excessive xerosis of the conjunctiva. There was very slight improvement in this respect during the course of the study, with 0.2 per cent of the total areas of the conjunctiva in Institution I and 0.1 per cent in Institution II initially exhibiting transparency or very slight translucency. (Twenty-four areas per child were examined routinely.) By the end of the study, 5.5 and 4.5 per cent of the areas, respectively, were transparent or only slightly translucent. On the other hand, the areas judged as exhibiting intermediate or marked translucency or opacity fell in commensurate degree (from 99.8 to 94.5, and from 99.9 to 95.5 per cent).

Few children in either institution showed corneal invasion past the limbus at any test period.

Mouth. The histological slides, on which smears of epithelial cells from the oral cavity were mounted and stained, were rated arbitrarily from Class 1 to Class 5. Class 1 represented no cornification or keratinization of the examined epithelial tissues; Class 5, severe cornification, with the other three arbitrary classes representing intermediate degrees of involvement. Standard slides representing the five classifications were used for comparative purposes.

The average rating of the children in Institution I initially was 2.6. They advanced to an average of 1.8 at the end of eight months, and then retrogressed to an average of 2.8 at the end of fourteen months.

Institution II children, on the other hand, improved in epithelial rating from an average of Class 2.8, to 1.7, to 1.4 at the three respective test periods.

The *tongue* improved markedly in the condition both of the filiform and the fungiform in both orphanages, according to the gross examination. There was a tendency for the children in Institution II to show slightly more improvement in this respect. The same trend was verified by the biomicroscope insofar as chronic lesions were concerned. With respect to acute tongue lesions, slight or moderate inflammation continued with most children in both institutions.

The *gums* improved somewhat according to the gross medical examination, with approximately the

TABLE 1

Summary of medical and dental observations on body status

MEDICAL AND DENTAL OBSERVATIONS ON BODY STATUS	INCIDENCE OF FINDINGS IN INSTITUTION I			INCIDENCE OF FINDINGS IN INSTITUTION II		
	Test I	Test II	Test III	Test I	Test II	Test III
EYES						
Adverse findings from gross examination 1; percentage of children exhibiting						
Infection of conjunctiva	9.8		0.0	6.8		0.0
Infection of sclera	6.6		0.0	3.4		0.0
Adverse findings from biomicroscopic examination						
Xerosis of the conjunctiva; percentage of examined areas exhibiting						
Transparency	0.0	1.1	0.6	0.0	0.2	0.0
Translucency						
Slight	0.2	4.5	4.9	0.1	4.5	4.5
Intermediate	20.2	28.6	24.5	17.3	25.9	30.9
Marked	59.2	52.5	55.4	56.5	56.3	50.9
Opacity	20.4	13.3	14.6	26.1	13.1	13.7
Corneal vascularization*	—	—	—	—	—	—
MOUTH						
Epithelial cells from base of buccal salivary glands, as shown by histological slides; average class	2.6	1.8	2.8	2.8	1.7	1.4
Tongue						
Adverse findings from gross examination; percentage of children exhibiting						
Filiform—atrophy						
Slight	34.4		18.0	36.6		2.4
Moderate	4.9		0.0	10.6		0.0
Marked	1.6		0.0	0.0		0.0
Fungiform						
Atrophy						
Slight	29.5		14.7	24.4		2.4
Moderate	16.4		0.0	12.2		0.0
Marked	0.0		0.0	0.0		0.0
Proliferation						
Slight	3.2		1.6	2.4		0.0
Moderate	0.0		0.0	2.4		0.0
Marked	0.0		0.0	0.0		0.0
Entire tongue						
Fissuring						
Slight	24.6		3.2	48.8		10.6
Moderate	1.6		0.0	2.4		4.9
Marked	0.0		0.0	0.0		0.0
Hyperemia						
Slight	57.4		22.0	80.5		17.1
Moderate	6.4		11.5	7.3		10.6
Marked	1.6		0.0	0.0		0.0
Acute lingual lesions as shown by biomicroscopic examination; percentage of children exhibiting						
None (Class 1)	0.0	0.0	0.0	5.1	0.0	0.0
Slight (Class 2)	80.0	85.2	61.6	66.7	87.1	61.5
Moderate (Class 3)	20.0	11.8	36.7	28.2	10.3	38.5
Marked (Class 4)	0.0	3.0	1.7	0.0	2.6	0.0
Very marked (Class 5)	0.0	0.0	0.0	0.0	0.0	0.0
Gingiva						
Adverse findings from gross examination; percentage of children exhibiting						
Inflammation	19.7		13.1	29.3		21.9
Recession	0.0		4.9	2.4		0.0
Acute lesions as shown by biomicroscopic examination; percentage of children exhibiting						
None (Class 1)	1.7	1.7	8.3	2.6	0.0	5.2
Slight (Class 2)	75.0	41.7	61.6	51.2	28.2	61.5
Moderate (Class 3)	1.7	0.0	18.4	10.3	2.6	12.8
Marked (Class 4)	21.6	53.3	10.0	35.9	61.5	20.5
Very marked (Class 5)	0.0	3.3	1.7	0.0	7.7	0.0
Pharynx						
Adverse findings from gross examination; percentage of children exhibiting						
Pharynx inflammation	6.6		0.0	2.4		0.0
Enlarged pharnyx	4.9		0.0	24.4		0.0

* Few cases in either institution exhibited penetration beyond the limbus at any test period.

TABLE 1—*Continued*

MEDICAL AND DENTAL OBSERVATIONS ON BODY STATUS	INCIDENCE OF FINDINGS IN INSTITUTION I			INCIDENCE OF FINDINGS IN INSTITUTION II		
	Test I	Test II	Test III	Test I	Test II	Test III
NOSE						
Adverse findings from gross examination; percentage of children exhibiting						
Slight discharge (not a common cold)	19.7		27.9	34.1		2.4
Presence of cerumen	0.0		11.5	0.0		0.0
EARS						
Adverse findings from gross examination; percentage of children exhibiting						
Discharge	0.0		11.5	0.0		0.0
Presence of cerumen	0.0		9.8	0.0		0.0
GLANDS						
Cervical						
Adverse findings from gross examination; percentage of children exhibiting						
Palpable anterior	43.9		3.3	51.2		0.0
Enlarged anterior	36.1		27.9	48.9		2.4
Palpable posterior	63.9		1.6	68.3		0.0
Enlarged posterior	13.2		6.6	21.9		0.0
Isthmus of the thyroid						
Adverse findings from gross examination; percentage of children exhibiting						
Palpable	13.1		3.3	82.9		0.0
Enlarged	3.3		1.6	4.9		0.0
SKIN						
Adverse findings from gross examination; percentage of children exhibiting						
Papular roughness						
Slight	11.5		37.7	26.8		7.3
Moderate	1.6		13.2	4.9		12.2
Marked	0.0		13.2	0.0		2.4
Adverse findings from biomicroscopic examination; percentage of children exhibiting						
Dryness						
None	48.3	21.7	30.0	28.9	36.9	28.9
Slight	28.3	55.0	36.7	39.5	42.1	47.4
Intermediate	18.4	23.3	33.3	23.7	18.4	23.7
Severe	5.0	0.0	0.0	7.9	2.6	0.0
Thickening						
None	30.0	13.3	33.3	15.8	34.2	39.5
Slight	48.3	75.0	41.7	57.9	55.3	44.7
Intermediate	21.7	10.0	25.0	26.3	10.5	15.8
Severe	0.0	1.7	0.0	0.0	0.0	0.0
Keratinization						
None	78.3	33.3	28.3	65.8	57.9	57.9
Slight	18.4	38.4	46.7	15.8	26.4	31.6
Intermediate	3.3	23.3	25.0	13.1	13.1	7.9
Severe	0.0	5.0	0.0	5.3	2.6	2.6
Keratinization with black spines						
None	100.0	56.7	66.7	89.5	84.2	76.3
Slight	0.0	26.7	28.3	10.5	13.2	21.1
Intermediate	0.0	16.6	5.0	0.0	2.6	2.6
Severe	0.0	0.0	0.0	0.0	0.0	0.0
Hyperemia						
None	90.0	71.7	70.0	78.9	92.1	73.7
Slight	8.3	20.0	26.7	21.1	5.3	23.7
Intermediate	1.7	8.3	3.3	0.0	2.6	2.6
Severe	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT STATUS						
Percentage of children of correct weight ± 10% for the sex, age, height, iliac width, and chest breadth according to Pryor standards (19, 20)	78.7	80.3	87.0	87.5	87.5	92.5
Percentage of underweight children for the sex, age, height, iliac width, and chest breadth (Pryor standards)	18.0	11.5	6.5	5.0	0.0	5.0
Percentage of children remaining in the same or proceeding to a higher Auxodrome, or age schedule of development according to the Wetzel Grid (21), Test I to III			74.2			90.2
Percentage of children falling to a lower Auxodrome, or age schedule of development, according to the Wetzel Grid (21), Test I to III			25.8			9.8

TABLE 1—*Concluded*

MEDICAL AND DENTAL OBSERVATIONS ON BODY STATUS	INCIDENCE OF FINDINGS IN INSTITUTION I			INCIDENCE OF FINDINGS IN INSTITUTION II		
	Test I	Test II	Test III	Test I	Test II	Test III
SKELETAL STATUS						
Adverse findings from gross examination; percentage of children exhibiting						
Deformities related to past undernutrition						
Chest, such as rachitic rosary, frontal bossing, pigeon breast	86.9			85.3		
Legs, such as bowed legs and knocked knees	67.2			95.1		
Findings from X-ray examinations						
Maturity (according to Western Reserve standards [2])						
Class 1	44.3	41.0	47.6	45.0	47.5	52.5
Class 2	14.7	18.1	11.4	10.0	5.0	2.5
Class 3	6.6	9.8	19.7	12.5	10.0	7.5
Class 4	6.6	11.4	1.6	12.5	12.5	15.0
Class 5	27.8	19.7	19.7	20.0	25.0	22.5
Mineralization, average; mineral density in terms of gm. of ivory/cc. (according to Mack and Smith [3])	0.7927	0.7264	0.7123	0.8034	0.8162	0.8870
DENTAL STATUS						
Overall rating, including caries and orthodontic evaluations; percentage of children receiving						
10 to 9 points (Class 1)	9.8		15.0	17.1		27.0
8 to 7 points (Class 2)	31.1		55.0	36.5		46.0
6 to 5 points (Class 3)	32.8		30.0	31.7		18.9
4 to 3 points (Class 4)	26.3		0.0	9.8		8.1
2 to 1 points (Class 5)	0.0		0.0	4.9		0.0
DMF/N value for permanent teeth						
Average	0.276		0.230	0.224		0.182
Percentage of children in specific range						
0.05 and below (Class 1)	8.2		4.8	9.8		12.0
0.06 to 0.25 (Class 2)	31.1		54.3	39.0		76.0
0.26 to 0.45 (Class 3)	52.5		39.3	51.2		9.6
0.46 to 0.65 (Class 4)	8.2		1.6	0.0		0.0
Above 0.65 (Class 5)	0.0		0.0	0.0		2.4
Carious condition of deciduous teeth; percentage of children in Classes 4 and 5	57.4			51.2		

same rate of improvement in both orphanages. According to the biomicroscopic findings, the children in the two institutions were similar in showing some improvement in acute gingival inflammation. Particularly was there a reduction in both groups in the percentage of children in the lower arbitrary classifications for acute gingival lesions.

Nose. A slight discharge of the nose (not associated with a common cold) was observed by the pediatrician in 19.7 per cent initially and in 27.9 per cent finally, of the children in Institution I. Institution II children exhibited this discharge to the extent of 34.1 per cent initially and 2.4 per cent at the close of the fourteen-month study. This marked difference in nasal discharges likewise was accompanied by the presence of cerumen in the noses of 11.5 per cent of the children in Institution I finally, but in none of the children in Institution II at the close of the study. None of the children in either institution exhibited this hardened secretion originally.

Ears. Initially, no children in either group showed discharges or hardened secretions. However, during the period of the study, 11.5 per cent of the children in Institution I developed discharges of the ear, and 9.8 per cent showed the presence of cerumen at the last examination, while none of the children in Institution II developed either condition.

Glands. Initially, 43.9 per cent of the children in Institution I and 51.2 in Institution II showed palpable anterior cervical glands, with 3.3 and 0.0 per cent, respectively, showing this condition at the final testing. Originally 63.9 and 68.3 per cent had palpable posterior cervical glands, with this percentage falling to 1.6 and 0.0 per cent, respectively.

Although both groups showed similarly marked reduction in the evidence of palpable cervical glands, Institution II vastly surpassed Institution I in the reduction in the percentage with an enlarged condition of these glands. In Institution I, the percentage of those with enlarged anterior cervical glands fell only from 36.1 to 27.9 per cent; Institution II children decreased from 48.9 to 2.4 per cent showing this adverse condition. Enlarged posterior cervical glands fell from 13.2 to 6.6 per cent of the children in the first institution, and from 21.9 to 0.0 per cent in the second.

Reduction in a palpable condition of the isthmus of the thyroid occurred to a far greater extent in Institution II than in Institution I, and swelling of the thyroid isthmus to a considerably greater extent.

Skin. The skin showed one of the most marked differences in the study between the two groups of children. Table 1 shows that the percentage of children in Institution I on the low meat dietary who showed papular roughness, including different degrees of acne, increased from 13.1 to 64.1 during the course of the study. The percentage in Institution II, on the other hand, decreased from 31.7 to 21.9 per cent.

Table I shows the results of the biomicroscopic examination for skin dryness, thickening, keratinization, keratinization with spines, and hyperemia. The marked differences in the performance of the two groups in this respect is evident. Thus Institution I increased throughout in the percentage of children showing most of these characteristics, whereas the children of Institution II decreased in many of the several respects.

Weight Status. The percentage of children within the proper weight range for the sex, age, height, and body width, according to Pryor standards (19, 20), was 78.7, 80.3, and 87.0 per cent for Institution I at the three test periods. For Institution II, percentages of 87.5, 87.5, and 92.5 were found initially and at the time of the other two tests. Thus some improvement for the height, as well as the sex, age, and body width was shown with both groups. According to these standards, however, a short child is favored because less weight is required to place him in any one of the five arbitrary classes.

To ascertain whether the children were growing in height according to schedule, as well as increasing in weight for the height, each child was plotted on the Grid devised by Wetzel (21), and his age schedule of development was determined from the age-height-weight data of the three test periods. It was assumed that three courses of progress were open to each child. Either he could remain in the same age schedule of development (indicating that, with the considerable caloric increase in his dietary he would advance in this respect if he had been retarded previously); or he could advance to a higher schedule (indicating that the new dietary gave him more opportunity for advancement than that previously consumed); or he could fall to a lower age schedule of development (indicating that the new dietary was not keeping him even in as high a schedule as his previous one).

From Test I to Test III, 74.2 per cent of the children in Institution I and 90.2 per cent in Institution II either remained in the same or proceeded to a higher age level of development according to the Wetzel Grid. On the other hand, 25.8 and 9.8 per cent, respectively, fell to a schedule lower than they had maintained previously. Thus the dietary in the second institution had been more effective in maintaining the same or achieving a higher schedule of height-weight development for the age. Males and females were evaluated on the proper charts for their respective sexes.

Skeletal Status. The children in both institutions had been markedly undernourished, both during their generally long stay in the orphanages and during their earlier lives. Early undernutrition is evidenced by the fact that 86.9 and 85.3 per cent among the two respective groups were adjudged to have had past rickets in major or minor form as shown by such manifestions as rachitic rosary, frontal bossing, and pigeon breast. Moreover, 67.2 and 95.1 per cent, respectively, showed malformations of the skeletal structure of the legs to a major or minor degree.

In Institution I, 44.3 per cent of the children initially and 47.6 per cent finally had a skeletal maturation status which matched that of the Western Reserve standards for the age and sex. In Institution II, the percentage matching the skeletal maturity standard for the sex and age was 45.0 per cent at the beginning and 52.5 per cent at the end of the study.

In skeletal mineralization the children in Institution I decreased from 0.7927 to 0.7264 gm. of ivory per cubic centimeter of bone by the end of eight months, and to 0.7123 gm. by the end of fourteen months. In Institution II, on the other hand, the mineral density values increased from 0.8034 to 0.8162 gm. of ivory per cubic centimeter of bone by the end of the first eight months, and to 0.8870 gm. by the close of the fourteen months. These represent highly significant changes.

Both groups of children grew considerably, the second group slightly more than the first. Both improved slightly in maturation. The conclusion, therefore, is inescapable that the children of Institution II were superior to those of Institution I in carrying on the bone mineralizing function.

Dental Observations. In overall evaluation by the dental examiner, both groups of children improved somewhat similarly. Improvement in dental care during the study unquestionably contributed to these improved ratings.

When the sum of the decayed (non-filled), missing, and filled permanent teeth divided by the number of permanent teeth (DMF/N factor) was considered, the percentage in the two higher classes increased markedly in both cases. This might at first seem to be an anomoly, since dental lesions cannot be healed. In many of the children in the study, however, deciduous teeth were being shed and permanent teeth were erupting. It will be seen that a new permanent tooth not yet carious would add to the denominator of this factor but not to the numerator. Hence the DMF/N factor may become smaller or show a seeming improvement under these circumstances.

In bacterial counts on the saliva and in reduction in solubilizing action of saliva on dental enamel, both groups showed marked and similar improvement.

TABLE 2

Summary of blood and urine tests

BLOOD AND URINARY TESTS	INCIDENCE OF FINDINGS IN INSTITUTION I			INCIDENCE OF FINDINGS IN INSTITUTION II		
	Test I	Test II	Test III	Test I	Test II	Test III
HEMOGLOBIN						
Average gm./100 cc. blood	11.4	13.3	12.5	11.5	13.2	13.3
Range; percentage of children with hemoglobin values of						
13.00 gm./100 cc. blood and above (Class 1)	5.0	63.4	20.0	0.0	58.6	68.3
12.99 to 11.50 gm./100 cc. blood (Class 2)	40.0	33.3	80.0	51.2	39.0	31.7
11.49 to 10.00 gm./100 cc. blood (Class 3)	46.7	3.3	0.0	46.4	2.4	0.0
9.99 to 8.50 gm./100 cc. blood (Class 4)	8.3	0.0	0.0	2.4	0.0	0.0
Below 8.50 gm./100 cc. blood (Class 5)	0.0	0.0	0.0	0.0	0.0	0.0
ERYTHROCYTE COUNT						
Average millions of red cells/cu.mm. blood	4.10	4.46	4.35	3.97	4.48	4.49
Range; percentage of children with erythrocyte counts of						
4.76 million/cu.mm. blood and over (Class 1)	1.6	11.5	4.9	0.0	9.8	0.0
4.75 to 4.51 million/cu.mm. blood (Class 2)	1.6	36.0	21.3	0.0	39.0	48.8
4.50 to 4.26 million/cu.mm. blood (Class 3)	23.0	26.2	39.3	9.8	31.7	46.3
4.25 to 4.01 million/cu.mm. blood (Class 4)	41.0	23.0	24.6	51.2	12.2	4.9
4.00 million/cu.mm. blood and below (Class 5)	32.8	3.3	9.9	39.0	7.3	0.0
Percentage of children in Classes 3, 4, and 5 (4.5 million/cu.mm. and below)	96.8	52.5	73.8	100.0	51.2	51.2
Percentage of children in Classes 4 and 5 (4.25 million/cu.mm. and below)	73.8	26.3	34.5	90.2	19.5	4.9
HEMATOCRIT (packed cell volume)						
Average percentage	36	37	37	39	38	39
Range; percentage of children with hematocrit of						
40 per cent and above (Class 1)	14.3	33.9	8.9	19.5	21.9	21.9
39 to 37 per cent (Class 2)	44.7	50.0	62.5	63.4	58.6	58.6
36 to 34 per cent (Class 3)	23.2	16.1	25.0	9.8	19.5	19.5
33 to 31 per cent (Class 4)	8.9	0.0	3.6	4.9	0.0	0.0
30 per cent and below (Class 5)	8.9	0.0	0.0	2.4	0.0	0.0
MEAN HEMOGLOBIN CONTENT PER CELL [(Hemoglobin × 10)/Red cell count]; percentage of children below $\frac{13 \times 10}{4.76}$	42.0	9.9	18.0	27.3	7.3	2.4
HEMOGLOBIN CONCENTRATION [(Hemoglobin × 100)/Hematocrit]; percentage of children below $\frac{13 \times 100}{40}$	62.3	26.2	21.3	80.5	17.1	9.9
LEUCOCYTE COUNT; average/cu.mm. blood	6400	7500	6800	6450	6900	6500
DIFFERENTIAL CELL COUNT						
Average percentage of						
Polymorphonuclear type	51.2	54.5	54.0	55.7	56.9	55.9
Lymphocyte type	44.8	43.0	44.0	40.7	41.9	42.6
Monocyte type	1.0	1.0	0.0	1.1	0.3	0.8
Eosinophil type	3.0	1.5	2.0	2.5	0.9	0.7
Basophil type	0.0	0.0	0.0	0.0	0.0	0.0
BLOOD PLASMA VITAMIN A						
Average mcg./100 cc. plasma	25.16	34.45	34.01	26.17	35.16	41.77
Range; percentage of children with vitamin A values of						
Above 35.5 mcg./100 cc. plasma (Class 1)	5.0	38.3	50.0	9.8	43.9	75.6
35.5 to 29.49 mcg./100 cc. plasma (Class 2)	13.3	38.3	18.3	34.1	22.0	17.1
29.5 to 23.49 mcg./100 cc. plasma (Class 3)	35.0	16.7	11.7	31.7	14.6	2.4
23.5 to 17.49 mcg./100 cc. plasma (Class 4)	31.7	5.0	13.3	14.6	14.6	4.9
17.5 mcg./100 cc. plasma and below (Class 5)	15.0	1.7	6.7	9.8	4.9	0.0
BLOOD PLASMA CAROTENE						
Average mg./100 cc. plasma	0.12	0.18	0.19	0.07	0.14	0.15
Range; percentage of children with carotene values of						
0.20 mg./100 cc. plasma and above (Class 1)	0.0	31.1	34.4	0.0	4.9	12.2
0.19 to 0.15 mg./100 cc. plasma (Class 2)	18.0	34.5	39.3	2.4	36.6	34.2
0.14 to 0.10 mg./100 cc. plasma (Class 3)	65.6	31.1	24.6	9.8	51.2	41.4
0.09 to 0.05 mg./100 cc. plasma (Class 4)	16.4	3.3	1.7	70.7	7.3	12.2
Below 0.05 mg./100 cc. plasma (Class 5)	0.0	0.0	0.0	17.1	0.0	0.0

TABLE 2—*Concluded*

BLOOD AND URINARY TESTS	INCIDENCE OF FINDINGS IN INSTITUTION I			INCIDENCE OF FINDINGS IN INSTITUTION II		
	Test I	Test II	Test III	Test I	Test II	Test III
BLOOD PLASMA ASCORBIC ACID						
Average mg./100 cc. plasma	0.77	1.32	1.47	0.90	1.38	1.26
Range; percentage of children with ascorbic acid values of						
1.10 mg./100 cc. plasma and above (Class 1)	19.7	80.3	78.7	26.8	90.2	70.4
1.09 to 0.90 mg./100 cc. plasma (Class 2)	13.1	13.1	13.1	12.2	2.5	17.6
0.89 to 0.70 mg./100 cc. plasma (Class 3)	16.4	5.0	8.2	9.8	7.3	4.8
0.69 to 0.51 mg./100 cc. plasma (Class 4)	24.6	1.6	0.0	17.1	0.0	7.2
0.50 mg./100 cc. plasma and below (Class 5)	26.2	0.0	0.0	34.1	0.0	0.0
BLOOD SERUM TOTAL PROTEIN						
Average gm./100 cc. serum	5.52	6.83	6.66	6.48	6.95	6.81
Range; percentage of children with total protein values of						
7 gm./100 cc. serum and over (Class 1)	0.0	44.3	21.3	20.0	47.5	30.0
6.99 to 6 gm./100 cc. serum (Class 2)	16.4	52.4	78.7	37.5	50.0	70.0
5.99 to 5 gm./100 cc. serum (Class 3)	72.1	3.3	0.0	37.5	2.5	0.0
4.99 to 4 gm./100 cc. serum (Class 4)	11.5	0.0	0.0	5.0	0.0	0.0
Below 4 gm./100 cc. plasma (Class 5)	0.0	0.0	0.0	0.0	0.0	0.0
Percentage of children in Classes 3, 4, and 5 (5.99 gm./100 cc. serum and below)	83.6	3.3	0.0	42.5	2.5	0.0
BLOOD SERUM ALBUMIN						
Average gm./100 cc. serum	4.08	4.77	4.83	3.98	4.71	4.89
Range; percentage of children with serum albumin values of						
5 gm./100 cc. serum and above (Class 1)	0.0	20.0	28.3	0.0	30.0	32.5
4.99 to 4 gm./100 cc. serum (Class 2)	65.0	78.3	71.7	55.0	65.0	67.5
3.99 to 3 gm./100 cc. serum (Class 3)	33.3	1.7	0.0	45.0	5.0	0.0
2.99 to 2 gm./100 cc. serum (Class 4)	0.0	0.0	0.0	0.0	0.0	0.0
Below 2 gm./100 cc. serum (Class 5)	1.7	0.0	0.0	0.0	0.0	0.0
Percentage of children in Classes 3, 4, and 5 (3.99 gm./100 cc. serum and below)	35.0	1.7	0.0	45.0	5.0	0.0
BLOOD SERUM GLOBULIN						
Average gm./100 cc. serum	1.47	2.09	1.82	2.39	2.24	1.91
Range; percentage of children with globulin values below						
1.5 gm./100 cc. serum	55.2	18.9	27.6	30.0	12.5	20.0
1.4 gm./100 cc. serum	48.3	15.5	13.8	27.5	10.0	12.5
1.3 gm./100 cc. serum	34.5	10.3	6.9	22.5	7.5	7.5
1.2 gm./100 cc. serum	32.7	5.7	6.9	12.5	7.5	2.5
ALBUMIN-GLOBULIN (A/G) RATIO						
Range; percentage of children with ratio						
Above 2.5:1	63.8	36.2	48.3	30.1	22.4	42.4
Approximately 2.5:1	7.0	7.0	13.8	12.3	17.6	30.1
Below 2.5:1	29.2	56.8	37.9	57.6	60.0	27.5
BLOOD PHOSPHATASE						
Average in King-Armstrong units	8.49	6.68	9.73	8.28	12.31	9.99
Percentage of children with excessive blood phosphatase units (20 K-A units and above)	21.7	58.3	21.7	10.3	20.5	7.7
URINARY THIAMINE						
Average mcg./1 hr. fasting sample	3.49	9.44	9.16	2.80	15.33	9.85
Range; percentage of children with thiamine values of						
6.0 mcg. and above (Class 1)	10.5	82.4	80.7	13.5	91.9	81.1
4.5 to 5.99 mcg. (Class 2)	12.3	7.0	12.3	13.5	0.0	8.1
3.0 to 4.49 mcg. (Class 3)	15.8	1.8	7.0	16.2	2.7	5.4
1.5 to 2.99 mcg. (Class 4)	26.3	7.0	0.0	24.3	5.4	5.4
1.49 mcg. and below (Class 5)	35.1	1.8	0.0	32.5	0.0	0.0
URINARY RIBOFLAVIN						
Average mcg./1 hr. fasting sample	22.20	27.09	30.41	28.62	54.42	61.42
Range; percentage of children with riboflavin values of						
60.00 mcg. and above (Class 1)	0.0	0.0	5.3	2.7	32.4	45.9
59.99 to 45.00 mcg. (Class 2)	1.8	7.0	8.8	5.4	16.2	10.8
44.99 to 30.00 mcg. (Class 3)	21.1	31.6	26.3	32.4	18.9	29.8
29.99 to 15.00 mcg. (Class 4)	43.8	47.4	50.8	35.2	24.3	13.5
Below 15.00 mcg. (Class 5)	33.3	14.0	8.8	24.3	8.2	0.0

Blood Tests. A summary of the results of the blood and urine tests is given in Table II.

In Institution I, the average *hemoglobin* values increased from 11.4 gm. per 100 cc. of blood to 13.3 gm. at the end of eight months; but the average fell to 12.5 gm. by the end of fourteen months. In Institution II, the values rose from 11.5 to 13.2 gm. at the eight-month period, and remained at 13.3 gm. at the close of the study.

Macy (20) gives 13 gm. of hemoglobin per 100 cc. of blood as the normal value for children. The children in Institution I who reached or exceeded this level were 5.0, 63.4, and 20.0 per cent at the three respective test periods; thus a rise followed by a decrease in percentage was shown. Institution II, on the other hand, had 0.0, 58.6, and 68.3 per cent of the children meeting or surpassing this value at the three test periods. Conversely, the percentage of children in Institution I who failed to meet this standard decreased from 95.0 to 36.6 per cent during the first interval of the study, and rose again to 80.0 per cent at the end of the fourteen-month period. In Institution II, the percentage below the Macy standard decreased from 100 per cent downward to 41.4 and 31.7 per cent at the three test periods.

Red cell or *erythrocyte count* average values in Institution I rose from 4.10 to 4.46 million per cubic millimeter at the end of eight months, and fell to 4.35 at the fourteen-month period; this was an increase from Test I to Test III of 6.0 per cent in average values. In Institution II, red cell count average values increased from 3.97 to 4.48 million per cubic millimeter during the first interval, and to 4.49 by the end of the study, or an overall increase in average values of 13.1 per cent.

Best and Taylor (23) give 5.0 million red blood cells per cubic millimeter for adult males, and 4.50 for adult females as normal values. Macy (22) states that values of 4.76 million are normal, and 4.5 represents nutritional anemia for children. In Institution I on the low meat diet, 96.8 per cent of the children originally were below this latter level. This percentage fell to 52.5 per cent and rose again to 73.8 per cent at the two later test periods. In Institution II, 100.0 per cent of the children had initially less than 4.5 million red cells per cubic millimeter of blood. By eight months this percentage had fallen to 51.2 per cent. The final value was 51.2 per cent of the children who were below 4.5 million red cells per cubic millimeter of blood.

Considering the percentage of children who were below 4.25 million red cells per cubic millimeter of blood—a value regarded as below normal in the Pennsylvania mass nutrition studies—Institution I had 73.8, 26.3 and 34.5 per cent in this category at the three test periods. Institution II on the higher meat level had 90.2, 19.5, and 4.9 per cent below 4.25 million red cell count at the three test periods, or a striking decrease throughout.

Children below 4.00 million red cells per cubic millimeter of blood were 32.8, 3.3, and 9.9 per cent in Institution I; and 39.0, 7.3, and 0.0 per cent at the three test periods in Institution II.

Hematocrit values were relatively high at all three test periods, assuming the 40 per cent packed cell volume suggested by Macy (22) as normal.

Values for hemoglobin, red cell count, and hematocrit, together with factors calculated therefrom, indicate that the great majority of the children in both orphanages originally had mild or severe hypochromic anemia (deficiency of pigmentation), usually with a reduction in red cell count. Anemia of the microcytic (or small red cell) type was rare.

Assuming the hemoglobin value of 13 gm. per 100 cc. of blood and the red cell value of 40 per cent, both suggested by Macy (22) to be normal, the value for the *mean hemoglobin content per cell* was $\left(\frac{\text{hemoglobin} \times 10}{\text{red cell count}}\right)$ calculated for each child at each test period. Children who fell below the optimum ratio in this calculated factor were 42.0, 9.9, and 18.0 per cent in Institution I, and 27.3, 7.3, and 2.4 per cent in Institution II, at the three times of testing.

Assuming again that 13 gm. of hemoglobin and 40 per cent packed cells, according to Macy (22), are normal for children, the *hemoglobin concentration* $\left(\frac{\text{hemoglobin} \times 100}{\text{hematocrit}}\right)$ was calculated for each child for each test period. In Institution I, the percentage of children falling below the optimum for this calculated value fell from 62.3, to 26.2, to 21.3 per cent. The percentage of children below the optimum in Institution II fell more sharply from 80.5 to 17.1, to 9.9 per cent.

The children in the study gave individual and average *leucocyte* counts which were within the normal range at all test periods.

Gradwohl (24) gives the Schilling classification for a normal differential cell count percentage distribution as follows: leucocytes of the polymorphonuclear type, 60 to 70 per cent; lymphocyte type, 21 to 30 per cent; monocyte type, 4 to 8 per cent; eosinophil type, 2 to 4 per cent; basophil type, 0.5 per cent.

Kolmer and Boerner (25) give a normal distribution as follows: leucocytes of the polymorphonuclear type—neutrophils (nonfilamented), 3 to 6 per cent and neutrophils (filamented), 50 to 67 per cent; lymphocytes, 20 to 30 per cent; monocytes, 2 to 6 per cent; eosinophils, 1 to 4 per cent; and basophils, 0 to 1 per cent.

The *differential cell counts* in this study were close to these supposedly normal values, with the chief difference being that the lymphocytes were some-

what higher in both institutions, both originally and throughout the study. In view of the fact that no notable change was experienced in these values over a fourteen-month period in the face of marked dietary changes, it is presumed that there was no great departure from the normal in any period of the study.

Distinct increases in *blood plasma vitamin A* were shown in both institutions at both test periods. These increases were decidely more marked in the institution with the more liberal allowances of meat. Thus in Institution I on the low meat intake (but with an equivalent allowance of vitamin A and provitamin A jointly as in Institution II) average blood plasma values at the three test periods were 25.16, 34.45, and 34.01 mcg. of vitamin A per 100 cc., respectively. In Institution II, these values were 26.17, 35.16, and 41.77 mcg. per 100 cc.

The percentage of children reaching an arbitrary value of 35.5 mcg. of vitamin A per 100 cc. of blood plasma were 5.0, 38.3, and 50.0 per cent in Institution I, and 9.8, 43.9, and 75.6 per cent in Institution II, at the three test periods.

Blood plasma carotene rose to a higher final average level in Institution I than in Institution II. The initial average value in Institution II, however, was lower, and the percentage increase in average values was greater.

Both institutions showed comparable changes in *blood plasma ascorbic acid* levels. Marked improvements in both institutions were effectuated. Originally 26.2 per cent of the children in Institution I and 34.1 per cent in Institution II were below 0.50 mg. of blood plasma ascorbic acid per 100 cc. At the end of the study no subject was this low in either group, and the majority had values of 1.10 mg. per 100 cc. or above.

Peters and Eisenman (26) give the range of normal *serum protein* values as 6.0 to 8.0 gm. per 100 cc. This corresponds to the two highest arbitrary classifications used in this report. Both institutions rose sharply in the percentage of children coming within this range; the respective percentages were 16.4, 96.7, and 100.0 per cent at the three test periods in Institution I, and 57.5, 97.5, and 100.0 per cent in Institution II. Average total protein values were respectively 5.52, 6.83, and 6.66 gm. per 100 cc. in the first, and 6.48, 6.95, and 6.81 gm. in the second orphanage.

For *serum albumin*, Peters and Eisenman (26) give 4.0 to 5.5 gm. per 100 cc. as the normal range. Those below this range were 35.0, 1.7, and 0.0 per cent in Institution I, and 45.0, 5.0, and 0.0 in Institution II, at the initial, eight-month, and fourteen-month periods. The percentage of subjects having values of 5.0 gm. or over rose from zero in both groups to a slightly higher level in Institution II (32.5) than in Institution I (28.3).

The same investigators, Peters and Eisenman (26) give the values of 1.4 to 3.0 gm. per 100 cc. as comprising the normal *globulin* range. The averages were within this range at all test periods in both institutions, although they rose slightly in the first and fell slightly in the second orphanage.

Although the average *globulin* values fell within the normal range of 1.4 to 3.0 gm. per 100 cc., many individual children fell below the lower value. Thus 48.3 per cent of the children in Institution I originally, 15.5 per cent after eight months, and 13.8 after fourteen months had values lower than 1.4 gm. In Institution II, 27.5, 10.0 and 12.5 per cent of the children had globulin values lower than 1.4 at the three test periods.

Hawk, Oser, and Summerson (27) give 1.2 gm. as the lower limit of the normal globulin range. Harrow and Sherwin (28) concur in this value. Other investigators have given values of 1.3 and of 1.5 gm. per 100 cc. as the lower limits of the normal range. In Table II the percentages of children falling below these suggested globulin values are shown.

Peters and Eisenman (26) give 2.5:1 as the *optimum albumin-globulin* (A/G) *ratio*. The percentage of children falling below this ratio was 29.2, 56.8, and 37.9 per cent at the three test periods in Institution I, and 57.6, 60.0, and 27.5 per cent in Institution II for the three periods of testing. Since a change in this ratio can be effectuated by a rise or fall in either of the values comprising the A/G relationship, a further scrutiny of the data is necessary to find the basis for the shift in percentage of children below the 2.5:1 ratio. The chief cause of the increase in percentage of children in th e first orphanage who fell below this ratio was an increase in the globulin fraction. The chief reason for a marked decrease in the children who fell below was a greater increase in the albumin than in the globulin fraction for a considerable number of children. Further study is needed to ascertain whether or not the difference in the chief protein source in the high legume, low-meat dietary as compared with the highe r meat, low legume regimen was a major cause for the difference in A/G ratio trend.

The average *phosphatase* values were well within the normal range for King-Armstrong phosphatase units. The average was composed of a wide range of values, however, with 21.7 and 10.3 per cent of the children in the respective institutions with excessive initial values. In Institution I, the percentage of children with abnormally high values increased to 58.3 after the eight-month interval and returned to the original value of 21.7 per cent at the close of the study.

In Institution II, excessive phosphatase values were shown by 10.3, 20.5, and 7.7 per cent of the children at the three test periods. The increase in better phosphatase values for the children of Insti-

tution II are in accord with their superior skeletal mineral density improvement.

Urinary Tests. The children on the higher meat intake were slightly superior to those on the low meat regimen in final average urinary excretion of thiamine as compared with the initial. They were markedly superior in increase in urinary riboflavin excretion. Originally, approximately one third of the children in both institutions excreted practically none of either of these B vitamins.

TABLE 3

Summary of functional observations

CONDITION	INSTITUTION I			INSTITUTION II		
	Test I	Test II	Test III	Test I	Test II	Test III
REFLEXES; percentage of children exhibiting						
Sluggish reflexes	9.9		22.9	14.6		0.0
Hyper-active reflexes	39.3		14.8	58.5		0.0
FATIGUE						
Absence of; average score*	2.0		2.9	1.6		2.8
Push-up test; average score		25.2			33.8	
DARK ADAPTATION: average class following bright light exposure**	2.5	2.9	2.9	2.9	2.6	2.2

* Perfect score was five points.

** Class 1 represented excellent, Class 5 very poor.

Functional Tests. *Heart functions* in the children of both institutions were adjudged by a cardiologist to be abnormal initially in one respect or another for more than 25 per cent of the children in both groups. The results of observations on the heart will be reported at a later time.

A summary of other functional tests will be found in Table 3.

As adjudged by a pediatrician, the percentage of children with sluggish *reflexes* increased from 9.9 to 22.9 per cent in Institution I and fell from 14.6 to 0.0 per cent in Institution II during the course of the investigation. The percentage of those with hyperactive reflexes decreased from 39.3 to 14.8 per cent in Institution I and from 58.5 to 0.0 in Institution II during the fourteen-month study.

On the basis of arbitrary evaluation by a medical examiner, both groups improved markedly in regard to the appearance of the absence of *fatigue*. In standard push-up tests given at the eight-month period, Institution II surpassed Institution I in average scores.

Scores for *dark adaptation* based on the light required to see the end-point following bright light exposure became somewhat poorer for Institution I (Class 2.5 to 2.9, with Class 1 excellent) and improved for Institution II (Class 2.9 to Class 2.2) during the course of the study.

SUMMARY

As shown in Part I of this report, three groups of orphanage children in central Pennsylvania participated in a fourteen-month study in which Institution I received meat twice weekly (including one serving of poultry or fish, and liver to the extent of one tenth of the one meat serving). Institution II received meat ten times weekly (including one serving of chicken or fish, and liver to the extent of one tenth of the meat). In the first institution, legumes supplemented by related vegetable foods were included to the extent that protein and other nutrients were equivalent on a calculation basis to those of Institution II. All other foods were included in a master plan in similar quantities in the two institutions, so that the dietaries of both would meet or exceed certain recommended allowances as outlined. Both groups of children were considerably undernourished when the study began.

Because of practical limitations within the institutions, caloric intake fell somewhat short of the recommendations in Institution II, and vitamin A intake was less than the Munsell recommendations in both institutions. Except for these factors, both institutions met or exceeded the recommendations, and both were very similar to each other in intake on a calculation basis, particularly of protein.

In physical well being, as shown in this part of the report, the children in both institutions showed marked improvement in most respects for which observations and tests were made.

Institution I (on the low meat intake) failed to surpass Institution II (on the higher meat intake) in any respect, whereas Institution II was superior to Institution I in the following respects:

(1) In epithelial cell condition. This was manifested in greater discharges of the nasal cavity and of the ears in the first institution, and in higher ratings for absence of keratinization of the epithelium lining the oral cavity as studied histologically.

(2) In the general condition of the skin, particularly with reference to the failure to develop cornified tissues.

(3) In reversal of atrophy of the filiform and fungiform of the tongue.

(4) In reduction of enlargement of the cervical and isthmus of the thyroid glands.

(5) In the skeletal mineralization process.

(6) In weight status for the sex and age (in spite of a smaller caloric intake).

(7) In hemoglobin.

(8) In red cell count.

(9) In blood plasma vitamin A.

(10) In certain serum protein fraction relationships.

(11) In blood phosphatase.

(12) In urinary excretion of thiamine (slightly), and of riboflavin (markedly).
(13) In reflexes.
(14) In absence of fatigue.
(15) In dark adaptation.

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Research Study at Columbia

The Department of Industrial Hygiene of Columbia University's School of Public Health has begun a long-range research study to learn the relation of diet to work. It is hoped to determine whether workers lose time from their jobs because their diet has not been adapted to the type of work they do. An effort will also be made to learn the effect of diet on industrial workers' resistance to various hazards typical of certain occupations—for instance, dusts, bases, and fumes to workers in the rubber, automobile, paint, and dye industries—and why some are affected by such harmful working environment and others go unharmed. In this study, rats fed various types of diets will be exposed to different types of toxic fumes found in industry. The work is being made possible by a grant from the National Institute of Health.—*Food Field Reporter, April 28, 1947.*

The Effect of Cooking on the Thiamine, Riboflavin, and Niacin Content of Sweetbreads[1]

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THE purpose of this study was to compare the thiamine, riboflavin, and niacin content and also the palatability of braised, fried, and creamed sweetbreads.

EXPERIMENTAL PROCEDURE

The throat glands of milk-fed calves were used. All were from a single lot frozen by a packing house according to the common procedure in handling these glands. The day before the sweetbreads were to be cooked for analysis, seven packages of approximately 1 lb. each were removed from the freezer and allowed to thaw 17 to 19 hr. in a refrigerator (40°F.). In the morning, the contents of the packages were mixed, washed, trimmed, and 1-lb. samples were withdrawn at random for analysis of the raw meat and for each cooking procedure. Four raw samples were analyzed, and each cooking method was repeated four times, the work being planned so that one raw sample served as a control for several cooking replicates.

Cooking Procedures

Braising. Twenty-five gm. (2 tbsp.) of cooking fat were heated in a heavy skillet to 140°C. as determined by a thermometer adjusted so that the bulb just touched the middle of the bottom of the skillet. Raw sweetbreads weighing 454 gm. (1 lb.) were then browned in the skillet and turned frequently. The heat was regulated so that the temperature of the pan ranged from 110° to 140°C. A thermometer was then inserted so that the mercury bulb was in the center of the largest sweetbread, the pan covered, and cooking continued over a low heat until the internal temperature of the meat was 90°C.

Frying. The sweetbreads were parboiled before frying by simmering 454 gm. (1 lb.) meat in 946 ml. (1 qt.) of water to which were added 15 ml. (1 tbsp.) vinegar and 1 tsp. salt. A thermometer was suspended above the pan so that the center of the mercury bulb was in the center of the water, which was heated to a temperature of from 91° to 94°C. before the sweetbreads were added. This temperature was maintained until another thermometer, inserted so that the mercury bulb was in center of the largest sweetbread, registered 90°C. The sweetbreads were then drained for 2 min., weighed, and the volume of cooking water measured.

Twenty-five grams (2 tbsp.) of cooking fat were heated in a heavy skillet to 140°C. as for braising. The parboiled sweetbreads were then placed in the skillet and cooked uncovered until a thermometer in the largest sweetbread registered 90°C. During frying, the heat was so regulated that the temperature of the pan ranged from 110° to 140°C. The sweetbreads were turned once during frying.

Creaming. The sweetbreads were parboiled as for frying. After draining, they were cut into ½-in. cubes and added to a white sauce prepared as follows: Five tbsp. of melted butter were combined with 3½ tbsp. of flour, to which were added 1¾ cups of milk. This mixture was cooked over hot water for 8 min. after the final addition of milk. As may be noted, the sauce was unusually rich, but repeated palatability scores showed it to be favored for sweetbreads over one less rich.

Cooking data for the various methods are given in Table 1.

Palatability Tests

Four replicates of sweetbreads cooked by each method except parboiling were tested by a panel of four or five experienced judges using the revised score card of the National Cooperative Meat Investigations (1) with three exceptions. These were: scores for fat were omitted because of the lack of visible fat in sweetbreads; texture was substituted for tenderness; and character of juice was omitted.

Analytical Procedures

The entire raw or cooked sample, together with the drippings which were too small in quantity for

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separate analysis, was blended in a Waring Blendor to insure homogeneity. Similarly, 40-gm. samples of creamed sweetbreads (including both sweetbreads and white sauce) were blended, and 40-gm. samples of the white sauce alone were blended. Forty-gm. samples of the raw, braised, parboiled, or fried sweetbreads were again blended with equal portions of water for 3 min. This addition of water was unnecessary with the creamed sweetbreads and the white sauce, since they were already sufficiently moist for assay. The liquid in which sweetbreads had been parboiled was not analyzed, as it was unpalatable due to its large volume and the added vinegar. Aliquots equivalent to 20 gm. of raw or cooked meat were then weighed into 500-ml. Erlenmeyer flasks; however, in the case of the white sauce alone, 40-gm. aliquots were used. To each flask were added 140 ml. sodium acetate buffer (*p*H 4.5 to 4.7) plus 20 ml. of a freshly prepared enzyme suspension containing 20 mg. papain and 20 mg. takadiastase per milliliter of acetate buffer. These samples were incubated under 5 ml. toluene for 48 hr. at 37°C.

All samples were steamed for 15 min. at the end of the incubation period. After filtering and making to volume, each sample was shaken with 5 ml. of chloroform and refiltered. Preliminary experiments showed this method to be as satisfactory as ether extraction for obtaining clear filtrates and eliminating drift.

This enzymatic procedure was used for the simultaneous release of thiamine, riboflavin, and niacin from the same sample so that the concentrations of each of these vitamins could be determined from one digest. Thiamine values were determined fluorometrically by the method of Hennessy and Cerecedo as modified by Hinman and co-workers (2). The microbiological procedure of Snell and Strong as modified by Strong and Carpenter (3) was followed for the determination of riboflavin, and that of Snell and Wright (4) using the medium suggested by Krehl and co-workers (5) was used to determine the niacin content.

Moisture and fat determinations were made on aliquots taken immediately after the first blending. These samples were dried to constant weight at 50°C. and 75 mm. pressure, ground in a mortar, and aliquots of approximately 2 gm. were weighed into fat extraction shells. The fat was extracted for 16 hr. with carbon tetrachloride since preliminary experiments showed that the same results were obtained with this solvent as with ether.

Vitamin retentions were calculated from the ratio of the vitamin content of the total cooked sample to that of the corresponding weight of raw sweetbreads, which was 454 gm. in each case. The vitamin value for the raw meat serving as a control for each cooking method was used, rather than the average for all the raw samples. A sample calculation follows:

$$\text{Percentage retention of thiamine} = \frac{\text{sweetbreads} = \text{total amount thiamine in sweetbreads} + \text{drippings}}{\text{amount thiamine in 454 gm. of raw sweetbreads}} \times 100$$

To find the vitamin retention for the meat in creamed sweetbreads, the amount of the vitamin in the white sauce alone was subtracted from that in the sweetbreads (including the sauce) before dividing by the amount in the raw meat. For parboiled sweet-

TABLE 1

Cooking data for sweetbreads

COOKING METHOD	WEIGHT OF RAW MEAT	WEIGHT OF COOKED MEAT	WEIGHT OF COOKED MEAT AND DRIPPINGS	AVERAGE PARBOILING TIME	AVERAGE ADDITIONAL COOKING TIME
	gm.	*gm.*	*gm.*	*min.*	*min.*
Braising	454	252	291		13
Parboiling	454	235		9	
Frying after parboiling	454	206	219	11	8
Creaming after parboiling	454	243	742*	14	0–10

* Weight of meat and white sauce.

TABLE 2

Analytical data for raw and cooked sweetbreads and white sauce

COOKING METHOD	MOISTURE	FAT	THIAMINE			RIBOFLAVIN			NIACIN		
			Average	Range	Total**	Average	Range	Total**	Average	Range	Total**
	%	%	*mcg./gm.*	*mcg./gm.*	*mcg./lb.*	*mcg./gm.*	*mcg./gm.*	*mcg./lb.*	*mcg./gm.*	*mcg./gm.*	*mcg./lb.*
Raw	84	1.5	0.82	0.62–1.01	370	1.68	1.19–1.97	760	25.8	23.1–30.0	11,692
Braising*	66	9.8	0.75	0.70–0.79	218	1.64	1.53–1.78	479	38.7	35.8–42.3	11,283
Parboiling	71	1.7	0.52	0.48–0.55	121	1.32	1.12–1.51	312	22.7	19.4–26.6	5,318
Frying after parboiling*	68	8.9	0.57	0.55–0.58	125	1.45	1.37–1.56	316	26.0	21.3–31.5	5,622
Creaming after parboiling*	74	9.4	0.53	0.52–0.54	392	1.33	1.26–1.41	988	8.9	8.6– 9.2	6,594
White sauce alone	74	13.7	0.54	0.53–0.56	273	1.34	1.32–1.36	674	3.2	3.1– 3.3	1,592

* Drippings were included with the braised and fried meat; white sauce with the creamed.

** Content of 454 gm. of raw sweetbreads, or of cooked meat prepared from this weight of raw sweetbreads. The figure for white sauce is the amount of vitamin in the white sauce used for one batch of creamed sweetbreads.

breads, the quantity of vitamin in the cooked meat was divided by that in the raw.

RESULTS AND DISCUSSION

Table 2 shows analytical data for raw and cooked sweetbreads. The raw meat contained 84 per cent moisture and 1.5 per cent fat, as compared with 75.4 per cent and 3.1 per cent reported for these two constituents in calves' sweetbreads by Chatfield and Adams (6). As would be expected, the moisture content of the cooked meat was lower than that of the raw, while the percentage of fat was higher for those cooking methods in which fat was added. The average thiamine content of the raw sweetbreads, 0.82 mcg. per gram, was higher than that of 0.39 mcg. per gram obtained by Pyke (7) using the thiochrome method. As the table indicates, the raw meat contained, on an average, 1.68 and 25.8 mcg. per gram of riboflavin and niacin, respectively.

The vitamin content of the braised samples expressed on the per-gram basis compared favorably with that of the raw, being almost as high for thiamine and riboflavin, and higher in the case of niacin. That this favorable comparison between raw and cooked meat is due to the loss of moisture on cooking rather than to superior retention is evident from the figures given in Table 3. Indeed, the thiamine and riboflavin retentions of 48 and 56 per cent are considerably lower than those commonly reported for cooked meats. It would appear that the soft texture of the sweetbreads permits a greater loss of these vitamins than does the firmer texture of muscle meats. The fact that 95 per cent of the niacin was retained during braising indicates that in this method where no water was added, heat alone did not destroy this vitamin.

TABLE 3

The retention of thiamine, riboflavin, and niacin in cooked sweetbreads

COOKING METHOD	THIAMINE RETENTION	RIBOFLAVIN RETENTION	NIACIN RETENTION
	%	%	%
Braising*	48	56	95
Parboiling	42	47	47
Frying after parboiling	28	37	47
Creaming after parboiling**	41	47	44

* Figures include the drippings. Those for parboiled meat do not include the parboiling liquid.

** Figures do not include vitamins added in the white sauce.

In contrast to braising, parboiling resulted in a loss of more than half of the three vitamins, due in part to their solution in the large volume of liquid used. Frying the parboiled meat caused some further losses of thiamine and riboflavin, but not of niacin, indicating again that the latter vitamin was not destroyed by heat. The thiamine value of 0.57 mcg. per gram for fried sweetbreads may be compared with that of 0.6 to 1.2 mcg. per gram obtained for this cooking method by Baker and Wright (8) using the rat bradycardia method.

In considering the vitamin content of the creamed sweetbreads, it must be remembered that white sauce was added to the meat for this method. Since the sauce was lower in niacin than the meat, the content of this vitamin per gram of creamed sweetbreads was low. However, the retentions calculated for this method were for the meat itself, not including the white sauce. These retentions indicate, as would be expected, that no further vitamin loss took place on cutting the parboiled meat and adding it to the hot white sauce.

Palatability scores shown in Table 4 indicate that the judges found sweetbreads cooked by all three methods to be acceptable. Frying scored slightly higher on several points than creaming, perhaps because of the firmer texture of the fried meat, while braising was considered less desirable than the other two methods.

CONCLUSIONS

Raw sweetbreads from the throat glands of milk-fed calves were found to contain 0.82, 1.68, and 25.8 mcg. per gram of thiamine, riboflavin, and niacin, respectively. Braised sweetbreads retained 48, 56, and 95 per cent of these three vitamins, showing that heat destroyed part of the thiamine and riboflavin, but only a negligible amount of the niacin. Retentions in parboiled meat were lower than in braised

TABLE 4

Palatability scores for cooked sweetbreads

COOKING METHOD	PALATABILITY*							
	Appearance	Odor		Flavor		Texture	Amount of juice	Composite rating
		Intensity	Desirability	Intensity	Desirability			
Braising	4.2	2.0	4.0	2.4	3.6	3.8	3.6	3.3
Frying after parboiling	4.8	2.0	4.6	2.4	4.4	4.6	4.1	4.2
Creaming after parboiling	4.8	2.0	4.5	2.3	4.2	3.8	4.0	3.9

* Scores are on the basis of five points as being the most desirable or intense, and on one point the least desirable or intense rating. Each number is the average of the grades given by four or five judges for four replications.

because of solution of all three vitamins in the water used. No additional vitamin losses were incurred on creaming the parboiled sweetbreads, but frying caused further losses of thiamine and riboflavin. The judges gave higher scores to the fried and creamed sweetbreads than to the braised meat.

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Preamble and Article I of the Constitution of the United Nations Educational, Scientific and Cultural Organization

THE GOVERNMENTS OF THE STATES PARTIES TO THIS CONSTITUTION ON BEHALF OF THEIR PEOPLE DECLARE

That since wars begin in the minds of men, it is in the minds of men that the defences of peace must be constructed;

That ignorance of each other's ways and lives has been a common cause, throughout the history of mankind, of that suspicion and mistrust between the peoples of the world through which their differences have all too often broken into war;

That the great and terrible war which has now ended was a war made possible by the denial of the democratic principles of the dignity, equality, and mutual respect of men, and by the propagation, in their place, through ignorance and prejudice, of the doctrine of the inequality of men and races;

That the wide diffusion of culture, and the education of humanity for justice and liberty and peace are indispensable to the dignity of man and constitute a sacred duty which all the nations must fulfill in a spirit of mutual assistance and concern;

That a peace based exclusively upon the political and economic arrangements of governments would not be a peace which could secure the unanimous, lasting, and sincere support of the peoples of the world, and that the peace must therefore be founded, if it is not to fail, upon the intellectual and moral solidarity of mankind.

FOR THESE REASONS

the States parties to this Constitution, believing in full and equal opportunities for education for all, in the unrestricted pursuit of objective truth, and in the free exchange of ideas and knowledge, are agreed and determined to develop and to increase the means of communication between their peoples and to employ these means for the purposes of mutual understanding and a truer and more perfect knowledge of each other's lives;

IN CONSEQUENCE WHEREOF

they do hereby create the United Nations Educational, Scientific and Cultural Organisation for the purpose of advancing, through the educational and scientific and cultural relations of the peoples of the world, the objectives of international peace and of the common welfare of mankind for which the United Nations Organisation was established and which its Charter proclaims.

ARTICLE I. Purposes and Functions

1. The purpose of the Organization is to contribute to peace and security by promoting collaboration among the nations through education, science and culture in order to further universal respect for justice, for the rule of law and for the human rights and fundamental freedoms which are affirmed for the peoples of the world, without distinction of race, sex, language or religion, by the Charter of the United Nations.

Challenges for Institutional Planning[1]

OWEN WEBBER

President, Owen Webber, Inc., New York City

ON-THE-THRESHOLD changes in food service operation will shortly introduce totally new equipment which could well be dignified by the word "apparatus," for it is essentially complicated in construction, but happily dependable in operation and practically automatic. The preparation of food in the future will probably be more adequately described by the term "conditioning" rather than "cooking." Whether food is roasted, fried, boiled, or stewed, it is actually processed so that it is in an acceptable condition to eat.

All of this new apparatus, which is still in the experimental production stage, will demand radically new procedures and the acceptance of an entirely new concept of food preparation methods and procedures. It will, however, be of special interest to the discriminating operator who now bases her reputation on serving freshly cooked items, cooked in small quantities at frequent intervals. Under conventional operation in practice today, such a system requires comprehensive scheduling, a coordinated organization, and fine operating technique, all of which are not generally enjoyed. With the use of electronic apparatus and the logical exploitation of frozen foods, both precooked and fresh, small quantity issuance of food will be considerably easier.

ELECTRONIC OVENS

It is my considered opinion that the hot food conditioning equipment of the future will substantially include the electronic oven to handle precooked frozen foods, together with some fresh food items of direct cooking. In addition, some apparatus for cooking "on the spot" will be required. This will consist of induction heated elements, together with a selected complement of utensils and pressure steamers, each having a small armature as an integral part of the bottom. A meat searing unit will be needed which will resemble a small electric annealing furnace. Here steaks or roasts will be surface-seared in a matter of seconds prior to placing in the electronic oven.

Electronic cooking as it has been developed thus far makes use of magnetron oscillators which were developed during the war as the energy sources for radar sets and function with a frequency of 2 billion 450 million cycles per second—a frequency assigned by the Federal Communications Commission for this purpose. The energy is directed into a horn, which beams and concentrates the energy into the food. No heat is generated until the energy is transmitted into the food. Then the molecules of the food itself are set in motion, and it is this agitation which generates the heat internally within the food. The waves are transmitted fairly efficiently by glass objects and are reflected by metal; hence glass cooking utensils may be used and the heat generated only in the food, not in the utensils.

The fact that the heating takes place evenly throughout the entire piece of food subjected to the energy explains the necessity of searing meat. Under ordinary methods of cooking, the outside of a steak or roast is subjected to a heat of 500°F. This evaporates the water content of the outer layer of the meat to such an extent that the fiber begins to carbonize, forming a crust. At the same time, the temperature of the interior of the meat may not go above 140°F. In electronic cooking, the heating takes place fairly uniformly throughout the meat, and while it is actually cooked, the outside never forms a crust. Thus, to present the desired appearance expected of a roast or a steak, searing is necessary before cooking by electronic energy.

Electronic ovens of the future will be available in different oven sizes and a choice of several operating speeds, both of which factors will be controlled by the number of super high frequency power tubes with which the oven is equipped. At the moment, only a single-tube unit with an oven size of 13 by 14 by 15 in. has been developed. Table 1 shows typical examples of the time requirements for conditioning various foods in this unit.

Although not yet available, with further developmental activities larger units may be expected. A two-tube oven, approximately 26 by 21 by 21 in. will afford twice the hearth or oven-bottom capacity of the single-tube unit. In addition, the operating

[1] Presented at the meeting of the Philadelphia Dietetic Association on March 11, 1947.

time will be appreciably accelerated—from 30 to 100 per cent, depending upon the volume of food placed in the oven. A three-tube oven is not an economically operable combination from the standpoint of hearth utilization; thus the next capacity may be a four-tube apparatus having an oven size four times that of the single tube. This will accommodate a large roast or bird. Such bulk roasts will require previous searing.

The capacity of an electronic oven cannot be increased by introducing a center shelf because a definite height—approximately 1 ft.—is needed above the food to regulate the frequency properly and to have the waves turbulate to desired efficiency. The prime consideration, therefore, is the area of the bottom of the oven. The larger this is, the more food can be spread on this hearth to be subjected to the action of the high frequency energy. For most applications, it seems that the four-tube oven will meet our needs. The tube grouping can extend to a wider hearth if desirable. Since each additional tube will activate approximately 1 sq. ft. of oven hearth, we may expect that ovens 4 or 5 ft. wide may be produced.

TABLE 1

Time requirements for conditioning various foods in a single-tube electronic oven

FOOD	TIME
Live lobster (1½ lb.)	2 min., 30 sec.
Breast of turkey (precooked frozen)	1 min., 50 sec.
Fillet of sole (raw)	1 min.
Filet mignon (medium rare)	20 sec. searing time, plus 50 sec.
Pork chops	30 sec. searing time, plus 1 min.
Au gratin dishes (packaged ¾ in. thick)	2 min.
Baked potato	1 min., 30 sec.
Corn on the cob	45 sec.
Half chicken	2 min., plus searing time
Whole chicken	4 min., plus searing time

The installation expense at the early stages for all participants will be high until volume production both of frozen foods and new equipment can be achieved. For example, a single-tube electronic oven today is worth approximately $1800, whereas it is believed that quantity output will eventually make it possible to sell the same equipment for about $450.

The expense connected with operating and maintaining such equipment (not including initial investment), however, will be low. The chief item will be the replacement of the super high frequency power tube, called the magnetron, which under mass production will cost a small part of the present outlay. It is said that the average operational life of this tube is 1000 hr. Considering the fact that the heating of a packaged meal requires an average operational cycle of 95 seconds, plus allowance for the warming up periods necessary, the life of the tube is presumably in excess of 30,000 meals. Calculated on present performance, each tube requires 4 kw. of power; thus a four-tube oven will require 16 kw., and a cabinet oven with a hearth size of 4 by 2 ft., which will probably use eight tubes, will require 32 kw. Current charges, then, using even 2 cents per kilowatt, for a single-tube oven will be only a fraction of a cent per meal.

INDUCTION HEATED EQUIPMENT

Induction electrical heating appliances for cooking, as distinct from apparatus functioning with heat radiated from conventional apparatus, offer possibilities for a wide range of uses, even though some limits should be placed on the scope of application of this principle. The cooking stages can be time controlled, and the temperature can be maintained within a close range by means of thermostats. The application would involve a special range top and equipment units which should be introduced as companion equipment to the electronic oven.

Other equipment developments which may be expected are:

(a) Ovens which, although utilizing conventional principles of heating, will have some mechanical device to keep the air circulating within the oven proper.

(b) "Steam functioning" equipment which would adequately support the "Singer" process of handling frozen food, such as electrically operated steam jacketed kettles, both fixed and tilting, ranging in size from 1 qt. up, and small unit pressure steaming units. In these could be heated frozen soups, stews, fricassees, and bulk *au gratin* dishes. These pieces of equipment would enable the use of methods complementary to those associated with electronic and circulating heat ovens.

The Singer process involves the packaging of precooked frozen foods in dual vegetable parchment bags or envelopes. In heating or conditioning these foods for eating, the food—still in the bag—is placed in boiling water or steam. The vegetable parchment from which the bags are made reacts well in storage and forms a "tight envelope" which is both leakproof and airproof, and is, in addition, sufficiently durable to stand up during the reheating process. Such procedure would permit the packaging of food items in individual portions, or in any reasonable number of portions, perhaps five or ten to a package. When individual portions are heated, the only preparational operations necessary will be the clipping of the top of the bag and the placing of the contents in the dish or plate. In using larger packages, such as those containing ten portions, the food would proceed to a steam table and be issued in the conventional manner. Incidentally, such con-

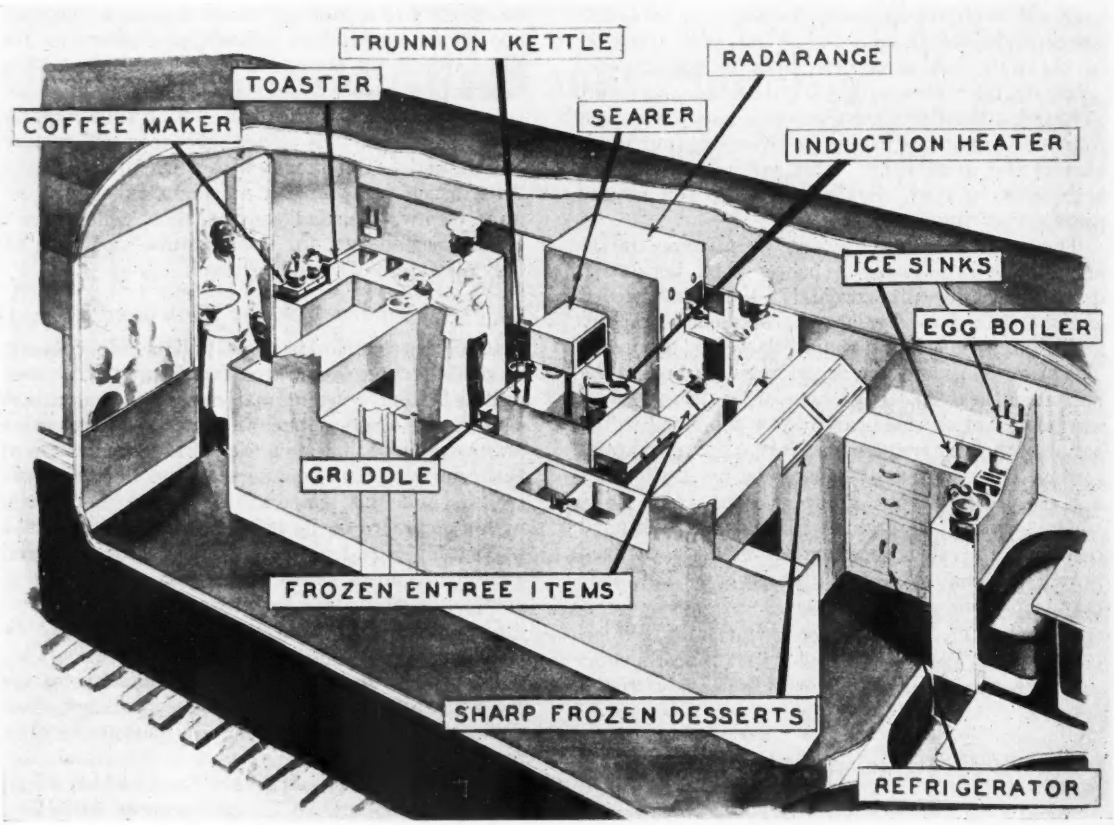

Fig. 1. Galley of electronic railroad dining car designed by engineers of American Car & Foundry Co. in collaboration with the author.

ditioning could also be done in the electronic oven, for one of its peculiarities is that food in a paper bag can be reheated or cooked without disturbing the bag.

(c) Disposable units to be used in lieu of china, glass, and silver for at least some of the most bulky standard items. Such a practice, it is felt, would reduce infection hazard, the expense of handling, the replacement cost due to breakage, and dishwashing operations.

(d) Triturators or garbage disposal equipment on each floor.

Because of high overhead costs and the continuing labor shortage—both of which seem unlikely to become better—the possibilities of changed procedures to circumvent these difficulties should be considered. Among the changes contemplated is the use of new types of foods, such as frozen foods in all forms, both fresh or cooked; dehydrated material in various forms; and processed coffee.

On the premise that frozen cooked food is acceptable to dietitians, then availability becomes a prime issue. For each type of market the weight, type, quality, and manner of packaging will differ. Because all groups cannot be accommodated from the outset, it may be sensible and even advisable for hospitals to pool their food requirements and establish procurement facilities which will function in zones or as elected groups or cooperatives. The most modernly equipped kitchen in each zone could be selected to function as the production center, and each hospital could be responsible for the storage of its own quota of deep freeze items on its own premises. For example, the total frozen cooked food requirements of an aggregate of 10,000 beds could most usefully issue from one commissary which could take care of all raw food purchasing, cooking, freezing, packaging, and warehousing for distribution. Possibly rations for 500,000 beds could easily be accommodated under one management.

Conclusive evidence of the possibilities of reducing costs through extremely large, centralized volume operations was afforded when I was identified in the design of a food combinate in the U.S.S.R. There it was found that in one plant designed for more than 750,000 meals per day, the cooking stages of steaming, deep fat frying, and roasting were more properly accommodated by mechanized cooking

apparatus which employed conveyors, temperature and time controls. The volume became such that the actual labor charge per meal was extremely low. Furthermore, certain elements which the small food operator would term garbage assumed quantities which afforded exploitation as by-products.

Inasmuch as each hospital included in any such cooperative enterprise would likely have a financial interest proportional to its bed capacity, the management could include on the board a dietitian from each hospital involved. The staff could come from sources approved by professional organizations, and the positions would have a most interesting range and high remuneration expectancy because of the elimination of waste. Whether dietitians eventually do this or wait for trusted suppliers of frozen foods to handle their needs is another matter.

If you consider that ultimately three quarters of the food as presently handled in the dietary department would be affected by the changed equipment and type of foods, what difference will such new developments make as to the floor area needed, the type of installations required, and the size of the staff of the dietary department? Gone will be our systems of centralized and decentralized tray service and operation. Instead, we may have a receiving department which will issue three quarters of the items directly to ward serving pantries where the trays will be made up and distributed.

What will the storeroom look like? As I see it, the refrigerated areas will consist of one or more rooms in which the circulating or traffic aisle space is unrefrigerated. This aisle, which will be wide enough to permit trucking, will be flanked on both sides by a series of lockers or compartments held at below-zero temperature. Some will be full height, extending as high as 7 ft. from the floor. Others will be half-size compartments, but all will be of the "reach-in" type. The compartments will be divided at close intervals by airtight, insulated, vertical partitions. This will permit the opening of any compartment and restrict the disturbance to only a small portion of the low-temperature air in the refrigerator as a whole.

Armored type doors will have panels of special glass permitting inspection of the packaged contents without opening the lockers. Receptacles will be fastened on the outside of each door to hold perpetual inventory cards. The floor outside and inside the refrigerator will be the same level to eliminate lifting and permit conveyance by special truck.

In addition, there will be a section for refrigeration of the conventional type and temperature to take care of milk, cream, eggs, cooked smoked items, fresh fruits, and salad materials.

The refrigerated facilities will quite likely increase substantially, especially if frozen pies, cakes, and soups are to be used. On the other hand, the dry stores area will shrink considerably in size. Many items will be missing. I conceive of the storage refrigerator as being 60 per cent greater in size and the dry stores as about one half of present norms.

The equipment will appreciably change by the introduction of special shelves. These shelves will provide a series of portable hopper-type sections supported on cantilever brackets attached to back standards, which in turn are attached to a chassis mounted on rubber-type ball bearing wheels with a dependable locking device. All of this will facilitate handling and also foster periodic stock turnover, essential shelf and stock cleaning, and "good housekeeping." To make mass production of these shelves possible, shelf sections and the hopper trucks can be standardized with established dimensions and the number of types restricted to only those which are considered essential.

FLOW OF FOOD PRODUCTION AND SERVICE

Let us briefly discuss the cycle of food movement. The issue of food would be as follows: In handling large bulk packages of frozen food, the food would go to the main kitchen for reheating and issue to ward serving kitchens or via central tray service as at present. The reheated or conditioned food could then issue from a steam table of the conventional type equipped with small capacity inserts or from an electric hot food serving table utilizing circulating hot air in an insulated pan instead of hot water. The advantage will be in the saving of cleaning, preparation, and cooking time, together with the need for less equipment, floor area, and labor. The dairy products and perishable items will require handling in the main kitchen in a relatively small area with simple equipment.

The special diet kitchen will remain, with the greatly restricted functions of today's main kitchen placed under its control.

Possibly the layout will feature a more centrally located storeroom than heretofore, with the dietary offices and main diet kitchen all an integral part thereof. These will be supported by the distributing centers or pantries on each floor, and that is all.

In the pantries, the equipment will include a two-temperature refrigerator, one part held at 0° and the other part maintained at 50°F; electronic heating apparatus; some small steam jacketed tilting kettles; a toaster; an egg boiler; a coffee maker; a twin sink; a small griddle; and induction electrical cooking elements.

PROBLEMS OF OPERATION

Although the problems of labor allocation will require the cooperation and long-range thinking of both the administrators and the unions, they can be solved without too much difficulty. What acceptable plan can be suggested which will satisfy both sides of the labor conference table?

In contemplating the use of new equipment and

frozen food, the administrator will realize that operations will be changed. The food will be conditioned or processed to an acceptable condition for eating by the mere operation of devices to control the temperature, time, and electronic ovens. This will in no way necessitate or bring into action any knowledge of cooking as it is known today. Consequently, the personnel involved in such work could hardly qualify for cooks' and chefs' ratings. This fact provides a partial answer to the labor problem—reclassification of staff.

Another answer comes if the food needs are pooled by designating one kitchen in a district for processing the precooked frozen food needed by two or three hospitals. Then present classifications of labor may be retained, but you will benefit from the greatly lessened overhead expense, due to reduction in what would then be prorated chefs' and cooks' expense.

Thus it can be seen that the answers to some of the problems involved in the revolutionizing of procedures are inherent in the use of these procedures.

The Whys of Electronic Cooking

Most people are not aware that light is a form of electromagnetic energy and that there has never been a more perfect radio and television receiver than the human eye, which is tuned to the frequency of light. The range in which the optic nerve receives is from 400 million million cycles (red) to 750 million million cycles (violet). Other colors are caused by combinations of frequencies within these limits. Since our eyes are not tuned to higher frequencies, we cannot see gamma, cosmic, or X-rays. Neither can we see the lower frequencies of radar or radio waves.

Even though we do not understand as much as we would like about these phenomena, we have been able to make practical use of them, for in the band of microwave frequency falls the energy utilized by radar equipment. The development of the cavity magnetron made possible the development of effective and practical radar used in the war.

More recently, the application of electromagnetic energy to cooking has been an extremely interesting development. It was found that this energy was capable of penetrating certain types of material, and in many cases, the material absorbed the energy to become extremely hot within a short time. Food was one of these materials, and it was immediately obvious that if this energy could be harnessed, a revolutionary type of cooking would be available.

Strictly speaking, this method is not new, for man has unconsciously used electromagnetic energy in cooking meats and other foods by glowing embers. In the process of burning, the charcoal embers emit infra-red radiation (high frequency energy), thus exhibiting many of the characteristics of the energy generated for use in radar equipment. It is this infra-red radiation which, by penetrating food to a certain depth, actually does the bulk of the cooking.

The usual heat of the fire affects the food only by conduction and actually plays a small part in the cooking process. However, the penetration of the electromagnetic energy (infra-red radiation) which comes from the open fire goes very little deeper than the surface, due to its extremely short wave length, and it is by conduction that the inner fibers of the food receive heat. Realizing that microwaves, the type of energy employed by radar, were of longer wave length and possessed greater penetrating power, we undertook an extensive program to harness this energy. It was felt that by directing the energy into a confined or closed chamber where it would come in contact with food, cooking times could be cut to a fraction of those required on or in conventional equipment.

Accordingly, an oven 13 by 14 by 15 in. in dimensions was finally developed. From these dimensions, it is obvious that it could not handle large masses of food, such as turkeys and roast. On the other hand, it was designed to handle food masses typical of short order or à la carte service. Another basic factor, important in determining the type of foods which can be cooked is the penetrating power of the energy, which at maximum efficiency is limited to 2½ in.

Since the power entering the oven is constant, cooking is controlled solely by time. These times vary almost in porportion to the weight of the food. For example, a cheese sandwich is ready to eat in 10 seconds, but if four cheese sandwiches are to be cooked, the time required is 30 seconds.

It is our opinion that ultimately electronic ovens will find 90 per cent or more of their utility in the reconstitution of pre-cooked frozen foods, as these products become more available. However, experiments have led us to believe that changes in the current methods of processing precooked frozen foods are needed in order to obtain optimum results with the electronic cooking equipment. For example, vegetables should not be completely cooked prior to freezing, inasmuch as the electronic cooking actually does a partial cooking while reconstituting the food from 0°F. or below to something in the neighborhood of 180°F. Wherever possible, meat, such as roast beef or lamb, or sliced chicken, is best reconstituted when overlapping of the slices is held to a minimum. Wherever there is overlapping, there is a tendency for a cold spot to remain. Best results are also obtained when foods are conditioned in containers which allow the retention of most of the moisture dispelled from the food during the period of defrosting or cooking.—*From an address by A. W. Welch, manager, Radarange Division, Raytheon Manufacturing Company, given before the New York Railroad Club on the occasion of its special "Electronic Evening," April 17, 1947.*

Training in 1947

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WE WHO carry responsibility in food production, whether it be for a hotel, restaurant, or institution, should recognize the continued need for a training program, because employment is still unstable and labor costs are high. The only solution to the situation is to train our inexperienced employees as quickly and efficiently as possible if we are to maintain economical and efficient operation. We must not forget that irrespective of our own abilities and skills in food production, we cannot operate a kitchen alone. We must work through the minds and hands of our employees. Thus it is important that we train these minds in the right direction.

Through the Bureau of Training of the War Manpower Commission, the government developed during the war a general training program which was used by industries in all parts of the nation. This program was known as "Training Within Industry," abbreviated to TWI, and it was applicable to any line of business or industry. It simplified the technique of training to the point where the layman could understand and practice it in any job. TWI consisted of two main parts—Job Instruction Training, JIT, and Job Relations Training, JRT. Job Instruction Training taught the individual skills on the job, and Job Relations Training taught the values and techniques of good human relations.

The principal steps in Job Instruction Training were simple, yet in four key points the whole procedure in general training was covered: They were as follows:

Step 1—Prepare the Worker. Put him at ease. Find out what he already knows about the job. Get him interested in learning the job. Place him in correct position to learn.

Step 2—Present the Operation. Tell, show, illustrate, and question carefully and patiently. Stress key points. Instruct clearly and completely, taking up one point at a time—but no more than he can master.

Step 3—Try Out Performance. Test him by having him perform the job. Have him *tell* and *show* you; have him explain key points. Ask questions and correct errors. Continue until you know *he* knows.

Step 4—Follow Up. Put him on his own. Check frequently. Designate to whom he goes for help. Encourage questions. Get him to look for key points, as he progresses. Taper off extra coaching and close follow-up.

The slogan in JIT was: "If the worker hasn't learned, then the instructor hasn't taught." This placed the responsibility squarely on the shoulders of the teacher, because it was believed that with proper instruction any individual can learn to do any given job, provided he had been properly selected for that job.

It was through a planned training program of this kind that American industry developed efficient and skilled workers in a hurry and was able to meet and in many cases exceed war production quotas. The results of its use were so commendable that it is now accepted as a necessary practice in production operations and has been adopted by management in all leading industries.

How can this kind of training be adapted to the food business? The food industry differs very little from any other field as far as training requirements are concerned. To operate a food production department, several employees are needed. Some of the job specifications call for higher degrees of skills than others, but all are established on a definite standard for operating efficiency. Each employee must be trained to understand this standard for efficient operation before he can be held responsible for the work methods.

The purpose of a training program, then, is: To train an individual to be a skillful worker and a good employee in as short a time as possible. Such a purpose is twofold. It increases and accelerates correct learning, and it gives the employee greater satisfaction in his job.

What must be accomplished in training? The employee must be taught:

(a) The mechanics of the job, or the details which his specific job entails.

(b) The work attitude, or what is expected of him as a good employee on this job.

(c) The work habits, or the regulations of this job and the best methods for doing it.

There are six methods of training, all of which should be incorporated in a training program, if that program is to accomplish the purpose stated above. These methods are: induction training; group instruction; on-the-job training; daily follow-up checking; refresher courses; and group meetings.

INDUCTION

Induction is the first step in organized training. It simply means introducing the new worker to his job, to his responsibilities as an employee of the company, and to his fellow workers. It is a method by which you help the new employee to feel at ease in his new surroundings, and it provides an opportunity for the supervisor and the newcomer to become acquainted.

During induction the supervisor shows the new employee his job analysis card and goes over it with him in detail. This card is a short, concise outline of the job responsibilities. It includes the starting time, meal periods, and quitting time, and outlines the key steps in the mechanics of the job. It states in consecutive order what the duties of the job are for the entire day, and so gives him all the necessary general information about the routine of the job. A good induction serves as a quick injection of loyalty, because it enables the new employee to obtain a brief introduction to the organization for which he will work and gives him something to which he can attach his loyalty. Induction is of primary importance in any training program.

CLASS INSTRUCTION

Parts of the training which involve general information about the company and the jobs are better discussed in group classes away from routine work. In such classes the work attitude and work habits can be taught along with general techniques that would be included in the job. These classes should begin immediately after the new employee comes into the organization.

For such classes best results are obtained when training is carried on in small groups. In this way everyone can participate, and the individuals will feel more free to express themselves, to enter into the discussions, and to ask questions. A successful instructor will keep the classes lively and interesting and will be able to draw everyone into the discussions by the use of good questions and by maintaining an informal attitude.

It is important that a definite time for classes be set in advance, and that the instructor be prompt to start and stop the classes at the appointed time. Also, nothing should be allowed to interfere with the continuance of the course of lessons once it is begun.

For training classes of this kind, an outlined program should be compiled in lesson-plan form. Such a program for a food production department would include a series of lessons planned in sequence as follows:

Lesson 1. Highlights of the History of Your Company and Its Personnel

This must be presented in an interesting way, so that the new employee will feel he knows something about the company or institution with which he is connected. Make him feel that now he is a part of this organization whose purpose it is to serve the public well. Emphasize the relative importance of his specific section or department, the responsibilities the department has to carry, and how important it is that each person do his share by:

(a) Being regular in attendance.
(b) Calling by telephone in case of failure to report for duty.
(c) Assisting others when he has free time.
(d) Progressing within the job by applying himself diligently.

Lesson 2. Organization and Cooperation

Tell how your department is organized into jobs and how these jobs are related, stressing the responsibilities which must be shared cooperatively. Emphasize the importance of good organization on every individual job, and demonstrate by taking one job and showing the right and wrong method of organizing. Stress the value of a cooperative attitude.

Lesson 3. Time and Motion Study.

Demonstrate the necessity of good organization and careful planning to avoid lost motions. Show how proper arrangements of utensils can eliminate waste motion and can save time and effort on the part of the worker. Many examples in right and wrong methods of working should be demonstrated to illustrate what is meant by careful planning of routine work to avoid waste motions and wasted time.

Lesson 4. Equipment

Describe and name the equipment included in the department. Point out its value in terms of dollars and cents, and its value in terms of labor-saving to the department. Stress the importance of learning to operate all pieces of equipment properly and the dangers involved if they are handled carelessly. This lesson should be followed by practical demonstrations on how to operate all pieces of equipment. This may be done gradually during on-the-job training, which will be discussed later.

Lesson 5. Safety Measures

Discuss the importance of extreme care in handling the various kinds of equipment. Point out the

care that is required in simple operations, such as the lighting of a large gas oven, running a chopping machine or a mixer, working with knives, working with hot cooking oils, or operating pressure steamers. Stress the fact that most accidents result from carelessness, and it is the responsibility of every individual worker not only to care for himself, but for his fellow workers as well. Safety measures can be well taught by the use of slide films and moving pictures. Here illustrations can be made spectacular and the dangers made more impressive.

Lesson 6. Standard Recipes

Display your recipe file. Explain how it is compiled. Give the history of how and where this file was developed, how carefully all recipes have been tested, and how long they have been in use. Show the standard method which is used in writing all recipes. Interpret any terminology and abbreviations that might be constantly used in the recipes, and demonstrate how to weigh and measure with exactitude. Explain how these recipes are used daily and the procedure each worker must follow to obtain recipes from the file or to return them to the file. Emphasize the value of standard recipes in the production of quality food.

Lesson 7. Quality Food

Quality food production is the result of skillful workmanship and attention to details. The same raw materials can be taken by twenty cooks and twenty different cooked products can result, ranging in degree from very bad to very good quality, depending upon the skills and the interest of the individual cook. Every good cook must have a keen appreciation for quality food and be willing to follow through with every detail in a recipe to obtain it. Many demonstrations should be conducted to illustrate quality food points. In such demonstrations, everyone should taste the product and discuss it pro and con. Employees should be made to realize that in food production work, quality food is always an important subject and that food testing is continuous.

Lesson 8. Good Service

Discuss accurate, standard portion services and demonstrate what is meant by exact portions. Demonstrate the importance of attractive plate arrangement from the standpoint of colors and the way food is placed on a plate. Point out the significance of speed in service and the value of good organization for elimination of waste motion on all stations.Emphasize the fact that the basic principle in good food service is:. *Serve hot food hot and cold food cold.* Point out what must be watched in your particular system to see that food is served accordingly.

Lesson 9. Sanitation and Good Housekeeping

Make clear the fact that everyone enjoys working in a clean, neat kitchen, but all must share the responsibility of keeping it in such condition. Cover the importance of personal cleanliness and the necessity of good housekeeping practices on the part of every individual in the department. Explain the sanitation regulations of your city and how they are put into practice in your department.

Lesson 10. Review Lesson

This should be a final period devoted to reviewing in general all information given in the previous lessons. A question and answer period is good, but it must be carefully led by the instructor.

At the completion of such a series of planned classes, the employee should have a good general knowledge of his job and what is expected of him as far as a work attitude and work habits are concerned.

Class instruction accomplishes something in addition to providing knowledge—it fosters unity. It provides an opportunity for establishing good human relations between supervisor and employee, and it contributes to a friendly, cooperative spirit among employees, because they learn to know one another in these small class groups.

Aids which might be used to advantage in group instruction include:

(a) Printed material about your company or organization and its service to the public, such as newspaper stories, magazine articles, pictures of various departments, pictures of company personnel, or any booklets published for educational purposes within the organization.

(b) House organ magazine which carries topics of interest to all employees.

(c) Moving picture or still picture films to illustrate your lessons. Visual education has been proved very successful, and in many instances good films can be obtained through rental libraries for a nominal fee. Such films should be carefully selected, however, to be certain that they will fit well into your own training program.

ON-THE-JOB TRAINING

This is a step in training which must accompany group instruction. It simply means working with the employee in his routine work and helping him to put into practice the techniques and the general information he is being taught in class.

It is a method by which practical instruction can be given to each individual employee while he is on the job. Gradually the instructor should leave the employee on his own, as he becomes thoroughly acquainted with the routine work, but the instructor must always be at hand should the employee have a question or need assistance.

DAILY FOLLOW-UP

Daily follow-up checks and individual conferences follow the class instruction and on-the-job training. This is essential if the employee is to continue to practice the important facts learned during his training period. If he is not supervised and he is not conferred with regularly, his interest in the job wanes and his work habits deteriorate. Such conferences should be informal and can lead to the development of a close relationship between employee and supervisor.

REFRESHER COURSES

Refresher courses are essential if top standards are to be maintained and progress in the department is to be achieved. All human beings have some failing. We grow stagnant on a job unless we refresh our minds as to its importance and find a new challenge in it.

Progression within the job is important, and this can be obtained through refresher courses. Such courses should be planned in consecutive lessons to cover all general and important phases and details of the department's jobs. Small group classes in this course also will bring best results.

REGULAR DEPARTMENT GROUP MEETINGS

Such meetings should be held to discuss department problems and challenges. This will help to maintain the cooperative spirit and the feeling of unity among workers. Keep such meetings informal and encourage participation and suggestions at all times.

A well planned training program is essential, but the proper selection of an instructor to do this training is also important. A good instructor must have:

(a) Patience, consideration, and understanding of people—the "ability to treat employees like people" and to convey to them the feeling of dignity and responsibility in their job.

(b) The faculty of being able to listen to employees and to encourage their questions and/or suggestions.

(c) The ability to organize and use time efficiently.

(d) A thorough knowledge of all jobs in the department.

A successful instructor will stimulate interest in a training program and develop unity by getting old and new employees to work together for the common interest of the department. She will develop efficiency in the individual workers by her leadership qualities and training techniques.

SUMMARY

The component parts of a training program, then, are: induction training; group instruction; on-the-job training; daily follow-up checking; refresher courses; and group meetings.

A well planned training program under the direction of a capable instructor can contribute a great deal toward efficient and economical operation. Careful and concentrated training develops skillful workers in a short period of time with the result that quality production can be achieved with better service at lower labor costs, and employees have greater satisfaction in their jobs. A planned training program, therefore, is indispensable in the successful industry of 1947.

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Dietitian Week in Cleveland

Through the efforts of a committee of the Professional Education Section of the Cleveland Dietetic Association, Mayor Burke proclaimed the week of May 17 to 24 as "Dietitian Week." This support from the mayor made it possible for the Association to carry on a concentrated, week-long publicity campaign for the profession.

Three radio stations gave time for interviews and discussion of the opportunities in dietetics and in addition, a number of slogans were devised which were used for program "breaks" during the week.

Newspaper publicity strengthened and supplemented the radio features, with dietitians being featured in news stories in several city dailies, and even "crashing" the editorial columns of the *Plain Dealer*. This editorial read in part: "In these days when all but the most opulent of personal budgets demand that, in obtaining their daily sustenance, the people consider both nutritive value and strict economy, the science of dietetics supplies a particularly valuable service. We are glad to urge that the public reflect on how the dietitian has evolved and assisted in the widespread dissemination of culinary formulae that have given wider variety, greater taste and eye appeal, and more nutrition to meals. Cleveland Dietitian Week should be the occasion for young women with aptitude employable in the field of dietetics to consider preparing for careers as dietitians, where opportunities far from ordinary employment have been burgeoning."

Restaurants, too, were extremely cooperative and displayed exhibits in their windows showing the work of the dietitians.

Retention of the B Vitamins in Beef and Lamb After Stewing[1]

II. Thiamine

SYLVIA COVER and ESTHER M. DILSAVER

Agricultural and Mechanical College of Texas, College Station

THE MEAT was prepared and cooked as described in the first report of this series (1). The thiamine phase of the study is reported here. Thiamine was determined by the thiochrome method of Harris and Wang (2) with slight modifications as reported by Cover *et al.* (3).

CONTENT

The average thiamine content is given (Table 1). The values for raw meat and for meat cooked by the twelve stewing methods are given on the moist and dry, fat-free basis. The values for broth were obtained originally as total micrograms in the broth from each 500 gm. of stew. They were converted to micrograms per gram of dry, fat-free raw meat, and they are reported in this way so that they may be compared directly with the corresponding values for meat.

The thiamine values for raw beef in this study ranged from 1.07 to 1.98 mcg. per gram on the moist basis. They fell within the range of thiamine values for beef (0.63–2.8 mcg. per gram) reported by Booher and Hartzler (4); Cheldelin and Williams (5); Cover, McLaren, and Pearson (3); Hinman, Halliday, and Brookes (6); Tucker, Hinman, and Halliday (7); and Waisman and Elvehjem (8). The average of the mixed muscles of brisket in the present study was 1.46 mcg. per gram, which is close to the average of 1.3 mcg. per gram obtained for ribs from a previous study in this laboratory by Cover, McLaren, and Pearson (3). However, in the present study most of the fat was trimmed off, whereas in the previous study all of the fat was mixed with the lean. If fat contains no thiamine, removal of the fat would increase the apparent content.

The thiamine values for raw lamb obtained from the mixed muscles of the triangle ranged from 1.40 to 2.22 mcg. per gram on the moist basis and averaged 1.73 mcg. per gram. They were within the range of those for lamb (0.51–3.3 mcg. per gram) reported by Booher and Hartzler (4); Cheldelin and Williams (5); McIntire, Schweigert, and Elvehjem (9); and Waisman and Elvehjem (8).

RETENTION

Retentions were calculated on the dry, fat-free basis. The average thiamine retention of each of the twelve stews is given (Table 2). Average retention in the meat varied from 29 to 48 per cent. Less was retained in the broth—4 to 24 per cent. Average total retention varied from 41 to 67 per cent. These variations are associated with differences in stewing procedure.

A direct comparison of retention by cooking processes can readily be made because the procedures under comparison contained an equal number of samples. This comparison is given (Table 3). An analysis of variance was used to show which procedures were related to loss of thiamine.

Browning caused significant losses in thiamine (Table 3). The beef stews which were browned lost more thiamine from both the meat and the broth than those which were not browned. In lamb stews the difference was largely in the broth. When total content is considered, the values for both beef and lamb were significantly lower for brown stews. The brown stews contained approximately 15 per cent less total thiamine than the light stews (Table 4).

Temperature of cooking, in contrast to searing, produced no significant difference in thiamine content in either beef or lamb stews (Table 3). Since thiamine is heat labile, this would seem to be surprising in view of the temperature differences of 193°F. to 250°F. It must be remembered, however, that the cooking times had been adjusted to produce equal tenderness with all procedures. Apparently a few minutes at a 15-lb. pressure (250°F.) were no more destructive to thiamine in beef and lamb than a

[1] Received for publication March 27, 1947. Supported in part by a grant from the National Live Stock and Meat Board.

TABLE 1

Thiamine content of beef and lamb stews

VARIABLES	THIAMINE*							
	Beef				Lamb			
	Moist basis	Dry, fat-free basis			Moist basis	Dry, fat-free basis		
	Meat	Meat	Broth	Meat and broth	Meat	Meat	Broth	Meat and broth
	mcg./gm.	*mcg./gm.*	*mcg./gm.*	*mcg./gm.*	*mcg./gm.*	*mcg./gm.*	*mcg./gm.*	*mcg./gm.*
Raw	1.46	7.03			1.73	8.80		
Cooked with a large amount of water								
Browned								
Pressure-cooked	0.88	2.65	0.98	3.63	0.82	2.55	1.07	3.62
Boiled	0.76	2.43	0.80	3.23	1.15	3.76	1.61	5.37
Simmered	0.79	2.85	0.78	3.63	0.94	3.07	1.28	4.35
Not browned								
Pressure-cooked	0.96	3.04	1.22	4.26	1.01	3.23	2.05	5.38
Boiled	0.73	2.80	0.92	3.72	0.79	2.68	2.14	4.82
Simmered	1.01	3.35	1.31	4.66	0.83	2.92	1.85	4.77
Cooked with a small amount of water								
Browned								
Pressure-cooked	0.91	2.71	0.29	3.00	1.17	3.56	0.84	4.40
Boiled	0.87	2.72	0.62	3.34	0.89	2.84	1.25	4.09
Simmered	0.92	2.87	0.43	3.30	1.20	3.75	0.93	4.68
Not browned								
Pressure-cooked	1.01	3.15	0.70	3.85	1.22	3.82	1.38	5.20
Boiled	0.95	3.05	0.50	3.55	1.27	4.12	1.53	5.65
Simmered	0.89	2.96	0.69	3.65	1.23	4.11	1.64	5.75

* Each value for raw meat is the average of four samples for each of six replicates. Each value for cooked meat is the average of six replicates.

TABLE 2

Retention of thiamine during stewing of beef and lamb

VARIABLES	RETENTION OF THIAMINE*					
	Beef			Lamb		
	Meat	Broth	Total	Meat	Broth	Total
	%	%	%	%	%	%
Cooked with a large amount of water						
Browned						
Pressure-cooked	38	14	52	29	12	41
Boiled	35	11	46	43	18	61
Simmered	41	11	52	35	15	50
Not browned						
Pressure-cooked	43	17	60	37	23	60
Boiled	40	13	53	30	24	54
Simmered	48	19	67	33	21	54
Cooked with a small amount of water						
Browned						
Pressure-cooked	39	4	43	40	10	50
Boiled	39	9	48	32	14	46
Simmered	41	6	47	43	11	54
Not browned						
Pressure-cooked	45	10	55	43	16	59
Boiled	43	7	50	47	17	64
Simmered	42	10	52	47	19	66

* Percentages were calculated on dry, fat-free basis. Each value is an average of six replications.

few hours at simmering temperature (approximately 193°F.), under similar conditions of searing and amount of water. Rice and Beuk (10) studied the relationship between time and temperature on the retention of thiamine in ½-in. cubes of ground pork. The retentions observed by them for pork and those for beef and lamb of the present study are compared (Table 5). The data for beef and lamb seem to agree in general with the data for pork reported by Rice and Beuk, but the data do not indicate perfect agreement between the three kinds of meat.

The *amount of water* in which the stews were cooked caused significant changes in thiamine content in the broth only (Table 3). More thiamine was found in the broth when large rather than small amounts of water were used. But that left in the meat partly compensated, so that the total thiamine retained is not significantly different for the large and small amounts of water.

The total quantity of thiamine found after cooking was distributed unequally between the meat and the broth. More of it was in the meat than in the broth, irrespective of the amount of water used for cooking, but the larger amount of liquid appeared to extract more of the vitamin (Table 6). This trend is in agreement with results from extraction studies.

A dietary allowance of 1.5 mg. of thiamine per day for moderately active men has been recommended by the Food and Nutrition Board of the National

TABLE 3

Average retention of thiamine and statistical evaluation of findings

VARIABLES	NO. OF SAMPLES		AVERAGE THIAMINE RETENTION						F VALUE†					
			Meat		Broth		Total		Meat		Broth		Total	
	Beef	Lamb	Beef	Lamb	Beef	Lamb	Beef	Lamb	Beef	Lamb	Beef	Lamb	Beef	Lamb
			%	%	%	%	%	%						
Browned	36	36	39	37	9	13	48	50	8.47*	1.21	15.40*	24.82**	13.78*	6.94*
Not browned	36	36	44	40	13	20	56	60						
Pressure-cooked	24	24	41	37	11	15	52	52	0.75	0.49	0.79	2.53	1.71	3.30
Boiled	24	24	39	38	10	18	49	56						
Simmered	24	24	43	40	12	17	55	57						
Large amount of water	36	36	41	35	14	19	55	54	0.05	5.49	36.67**	7.04*	1.97	0.65
Small amount of water	36	36	42	42	8	15	49	57						

† Calculated from content on dry fat-free basis only. Error terms were the first order interactions of the variables x replicates.

* Significant difference. F values needed for significance at the 0.05 level were: browning, 6.61; temperature, 5.79; and water, 6.61.

** Highly significant difference. F values needed for high significance at the 0.01 level were: browning, 16.26; temperature, 13.27; and temperature, 16.26.

TABLE 4

Difference in thiamine content associated with browning

CONDITION OF MEAT	NO. OF SAMPLES		TOTAL THIAMINE*	
	Beef	Lamb	Beef	Lamb
			mcg./gm.	*mcg./gm.*
Browned	36	36	3.35	4.42
Not browned	36	36	3.95	5.25
Difference			0.60	0.83
Percentage of difference**			15	16

* On dry, fat-free basis.

** The thiamine content of the not-browned stew was considered 100 per cent.

TABLE 5

Comparison of thiamine retention in pork, beef, and lamb in relation to length of cooking time and temperature

TEMPERATURE	THIAMINE					
	Pork*		Beef**		Lamb**	
	Cooking time	Retention	Cooking time	Retention	Cooking time	Retention
	min.	%	*min.*	%	*min.*	%
121°C.	30 min.	52	20 min.	58	14 min.	60
99°C.	60 min.	75	150 min.	52	75 min.	59
	120 min.	56				
93°C.	120 min.	69	180 min.	60	140 min.	60
	240 min.	50				

* As reported by Rice and Beuk (10).

** Each retention figure is the average of twelve individual stews. Retentions for only light (not browned) stews are given because browning introduced another variable which was not considered by Rice and Beuk.

Research Council (11). Before cooking, one serving of meat stew (125 gm. raw) would contain 0.182 mg. of thiamine for beef and 0.216 mg. for lamb. Searing was the only cooking variable which affected total retention from a statistical point of view. Brown stews with 50 per cent retention would supply 6 to 7 per cent of the thiamine allowance, while light stews with 60 per cent retention would furnish 7 to 9 per cent. The actual effect of searing is less than 2 per cent of the recommended daily allowance. The effect of searing on the thiamine value of meat is of doubtful practical importance unless the food supply is severely limited.

CONCLUSIONS

(a) Approximately 40 to 65 per cent of the original thiamine was retained after stewing. The average for all methods was about 50 per cent.

(b) Browning appeared to be the only one of the cooking variables studied which increased the destruction of thiamine. The brown stews contained approximately 15 per cent less thiamine than the light stews.

(c) Differences in cooking temperature of approximately 93°C. to 121°C. (193-250°F.) showed little effect on retention, but the cooking times were adjusted to give equal tenderness with all procedures. Thus the times were shorter for the higher cooking temperatures.

(d) A serving of meat stew would furnish about 6 to 9 per cent of the daily allowance of thiamine.

TABLE 6

Distribution of thiamine between meat and broth

AMOUNT OF WATER	THIAMINE CONTENT*		DISTRIBUTION OF THIAMINE	
	Meat	Broth	Meat	Broth
Beef				
	mcg./gm.	*mcg./gm.*	*per cent*	*per cent*
Large	2.85	1.00	74	26
Small	2.91	0.54	84	16
Lamb				
Large	3.03	1.67	64	36
Small	3.70	1.26	75	25

* On dry, fat-free basis. Each value is the average of thirty-six samples.

Searing of beef or lamb for stews reduced the supply of thiamine by an amount too small to be of practical importance in comparison with the recommended daily allowance.

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Tryptophane and Niacin Metabolism in Humans

The addition of tryptophane to controlled diets leads to an increased urinary excretion of niacin derivatives. The extra excretion of these substances depends on the amount of tryptophane.

Two diets were fed experimentally to human subjects. One diet (the wheat diet) contained 250 gm. of unenriched flour, while the other (the corn diet) contained 60 gm. of this flour and 190 gm. of degerminated corn meal and grits. Each of these diets provided about 40 gm. of protein and 5½ to 6 mg. of niacin per day. The urinary tryptophane and niacin derivatives were lower when subjects were fed the corn diet. This may have been due to the lower tryptophane content of the corn diet, to an inhibiting agent in corn, or to a combination of these factors.

The addition of indole 3 acetic acid to the wheat diet had little effect on the urinary excretion of these compounds. Therefore, it did not appear to be the inhibitory substance in corn as suggested by Kodicek, Carpenter, and Harris. Judging from load test excretions, the administration of tryptophane to the subjects on these diets low in niacin replenished their tissues with niacin.

In 1937 it was shown that niacin was a vitamin which cured or prevented pellagra. The diets of the people who developed pellagra usually contained a good deal of corn meal and grits and were low in protein-containing foods. It has also been shown that the presence of corn in diets of animals increased their requirement for niacin; that tryptophane could replace niacin as a growth factor for rats receiving a corn diet; and that the feeding of tryptophane to rats led to an increased excretion of niacin derivatives.

Early this year workers at Tulane and Duke Universities showed independently that similar results are obtained with humans. About one fiftieth of the tryptophane given *appears* to be converted to niacin. The requirement for niacin, therefore, depends on the foods in the diet, especially the protein and its tryptophane content. Certain foods, such as milk and eggs, which are low in niacin but rich in good protein are known to be anti-pellagragenic foods.

There is also evidence that there may be a substance in corn which inhibits the utilization of niacin or of tryptophane as a precursor of niacin. The development of pellagra, therefore, appears to result from a diet low in both niacin and tryptophane, and is possibly influenced by an inhibitory agent in corn.—*Abstracted from a paper given by Herbert P. Sarett and Grace A. Goldsmith of the Nutrition Research Laboratory, Tulane University School of Medicine, before the Federation of American Societies for Experimental Biology on May 20 in Chicago.*

Editorial

PERSONALITY FACTORS IN PUBLIC RELATIONS

The dietitian has justifiably prided herself on her scientific training in chemistry, physiology, foods, and nutrition, and in her ability to plan a "well balanced diet." But has her training in psychology, sociology, and education extended to the common human needs of patients, employees, coworkers, and above all—of herself? Does this understanding of "balanced personality" extend to effective human relations in her own department, with other departments, and with her superiors? A recent survey conducted by Mary deGarmo Bryan *et al.* to obtain the opinions held by employers concerning the dietitian indicated that a crucial requisite was not only for "balanced diets" but for "balanced personalities."

What does the administrator or employer expect of the dietitian? Robert E. Neff, superintendent of the Methodist Hospital, Indianapolis, at the first conference of directors of approved courses of the American Dietetic Association held in Cincinnati on October 12 and 13, 1946, stressed the critical need for voluntarily assuming an attitude of generosity, tolerance, friendliness, cordiality, poise, kindliness, courtesy, and consideration for others. "Making excuses for poor service with the hope of lessening the blame for that service," he said, "is not enough. Insight into the basic and underlying problems is essential. While the dietitian must be able to set and maintain high standards, it is equally important to avoid rigidity and to be able to make adjustments to the total needs of the institution."

F. W. Huntington, director of personnel administration, Ralston Purina Company, St. Louis, also described the characteristics sought in the dietitian, as they are related to the needs of industry. "We want physically sound employees—the pressure of work demands it—people with sound bodies, radiant good health, and more than average energy. Mentally, we want to select employees who are well trained and are capable of purposeful thinking, creative planning, and painstaking thoroughness. On the social side, we want genuine friendliness, a sense of humor, and a willingness to cooperate. On the character side, we want employees with good will toward others, humble reverence, personal integrity, and an innate sense of fair play."

The need for these same personality traits was further emphasized by Veronica Morrisey, manager of the Tea Room at L. S. Ayres and Company, Indianapolis, when she stated that she expected the members of her staff to know how to supervise, how to organize, how to follow through, and to be professionally loyal. Likewise, Martha Koehne, chief nutritionist, Nutrition Service, Ohio Department of Health, in pointing out the qualities necessary for public health work, emphasized the importance of getting along with other people.

Evelyn Smith, associate professor of institution management, University of Illinois, laid down some principles by which the dietitian may set her course. She stressed the need for the dietitian to dignify her position and to see the problem as a whole, to have the interest to help develop it, and to possess the stability to see it through. She feels that an important part of the dietitian's work is meeting people and supervising, and hence she should practice good public relations in her daily work through her contacts both with personnel and with customers. These qualities she feels the employer demands and has a right to demand, in addition to technical skill.

Surveys made in industry to learn why employees have failed or have been dismissed have shown repeatedly that incompetence is seldom the reason. The most frequent cause for dismissal has been the inability to meet the challenge of working as a part of a group. Conversely, such surveys have also shown that the ability to maintain good human relations is perhaps the determining factor in "getting ahead," and certainly more important than technical skill, knowledge, or ability. It is safe to assume that in these respects dietitians do not differ from the rest of the human race, and, as a corollary, it should be obvious that the ability to work with people and to adapt to existing conditions of work will result not only in effective public relations for the particular organization and the profession, but in personal success for the dietitian as well.

A.D.A. FOREIGN SCHOLARSHIP COMMITTEE

An increasing number of students from foreign lands are expressing interest in receiving training in dietetics in this country. To determine what can be done at the graduate level to help such students and to encourage the development of dietetics as a profession in other countries, a Foreign Scholarship Committee has been appointed by the American Dietetic Association. Members of this Committee are: Frances MacKinnon, chairman: Anne Stewart Miller, co-chairman; Dr. Martha Kramer; Dr. Orpha Mae Thomas; E. Evelyn Smith; and Sister Romuald.

Miss MacKinnon is nutrition consultant for the Children's Bureau, and in this capacity she visits several Latin American countries to serve as nutrition adviser. Thus she will be familiar with the needs of Central and South American students. Mrs. Miller, who will serve as co-chairman, was a representative of A.D.A. at the recent meeting in Philadelphia of the United Nations Educational, Scientific, and Cultural Organization (UNESCO). She has also lived and worked in the Middle East. Dr. Kramer, now assistant dean of the School of Home Economics, Kansas State College in Manhattan, has taught for several years in China and the Orient. She also attended the regional meeting for UNESCO held in Denver in May. Dr. Thomas, assistant professor, Teachers College, Columbia University, will provide the viewpoint of the college or university on qualifications of foreign students, while Miss Smith, associate professor of institution management, University of Illinois, and a former member of the A.D.A. Membership Committee, will understand the requirements of the Association. Sister Romuald, as director of the approved course for dietetic interns at Good Samaritan Hospital, Cincinnati, will be able to advise concerning students who wish to undertake dietetic internships in this country.

Because of the cosmopolitan interests and varied experience the members of this Committee will bring to this new activity of the Association, it is felt that a balanced viewpoint will result which will promote both the interests of the students themselves and of the Association.

REPORT OF THE NOMINATING COMMITTEE, AMERICAN DIETETIC ASSOCIATION, 1946-47[1]

The Nominating Committee of the American Dietetic Association—Helen S. Mitchell, Helen Cate, Nelda Ross, Ruth E. Forsberg and Bessie Brooks West, Chairman—presents the following ballot for 1947–48:

President-Elect

Helen E. Walsh: B. S., Iowa State College, Ames; M.A., Teachers College, Columbia University, New York City.

Positions held:

Nutritionist, Los Angeles County Health Department and Los Angeles County Tuberculosis and Health Association
Supervising Nutritionist, Los Angeles County, State Relief Administration of California
Assistant Professor, School of Home Economics, Oregon State College, Corvallis
Nutrition Field Consultant, National Nutrition Program, Washington, D. C.
Nutrition Consultant, Nutrition Section, States Relations Division, U. S. Public Health Service, Washington, D. C.
As of September 1, 1947, Nutrition Consultant, California State Department of Public Health, San Francisco

Professional activities:

Chairman, Community Nutrition Section, A.D.A.
Vice-President, A.D.A.
Chairman, Community Education Section, A.D.A.
President, California Dietetic Association
Secretary-Treasurer, California Dietetic Association
Program Chairman, District of Columbia Dietetic Association

Vice-President

Beulah Hunzicker: B.S., M.S., University of Wisconsin, Madison

Positions held:

Dietitian, University of Michigan Hospital, Ann Arbor
Dietitian, Presbyterian Hospital, Chicago
Since 1936, Director of Dietetics, Presbyterian Hospital, Chicago

Professional activities:

Treasurer and Chairman, Finance Committee, A.D.A.
Member, House of Delegates, A.D.A.
Convention Chairman, A.D.A.
President, Illinois Dietetic Association

Cora E. Kusner: Diploma, Battle Creek College, Battle Creek, Michigan

Positions held:

Assistant Dietitian, Children's Fresh Air Camp and Hospital, Cleveland
Since 1924, Dietitian, Colorado State Hospital, Pueblo
Present position, Chief Dietitian and Director of Approved Course for Dietetic Interns, Colorado State Hospital, Pueblo

Professional activities:

Member, House of Delegates, A.D.A.
Chairman, Food Administration Section Project, A.D.A.
President, Colorado Dietetic Association

Publications:

Author of articles in this JOURNAL and in hospital publications.

Treasurer

Fern W. Gleiser: B.S., University of Washington, Seattle; M.S., Teachers College, Columbia University, New York City

Positions held:

Assistant Manager of Commons, University of Washington, Seattle
Assistant Director of Residence Halls and Manager of Tea Room, Oregon State College, Corvallis
Instructor in Institution Administration, Teachers College, Columbia University, New York City
Assistant Professor, Institution Administration, Drexel Institute, Philadelphia
Professor and Head of Institution Management, Iowa State College, Ames
Since 1944, Professor of Institution Economics and Management, University of Chicago

Professional activities

Member: Finance Committee, Nominating Committee,

[1]Details concerning provision for making other nominations are stated in Article V, Section 6, of the By-Laws of the Association, as adopted October 26, 1944.

Administrative Approval Committee; Special Committee on Professional-Economic Status of the Dietitian, A.D.A.
Member, House of Delegates, A.D.A.
President, Iowa Dietetic Association
Vice-President, Illinois Dietetic Association
Member, Omicron Nu and Phi Upsilon Omicron

Publications:

Articles in this JOURNAL and other professional publications

Lida A. Jamison: B.S., University of Wisconsin, Madison

Positions held:

Teacher of Home Economics in high school
Assistant Dietitian, Presbyterian Hospital, Chicago
Since 1931, Dietitian, Chicago Dietetic Supply House

Professional activities:

Member, Finance Committee, A.D.A.
President, Illinois Dietetic Association
President, Chicago Dietetic Association
Member, Home Economists in Business

Nominating Committee

The following candidates (five of whom are to be elected) for the Nominating Committee for 1947–48 have been selected as representatives of special fields of interest in the profession:

Alta B. Atkinson: B.S., Montana State College, Bozeman; M.A., Teachers College, Columbia University, New York City. Present position: Manager, Teachers College Cafeteria, and Associate in Home Economics, Teachers College, Columbia University; President, New York State Dietetic Association.

A. June Bricker: B.S., Battle Creek College, Battle Creek, Michigan. Present position: Nutrition Director, Connecticut Dairy and Food Council, Hartford.

Anna dePlanter Bowes: B.S., M.A., Teachers College, Columbia University, New York City. Present position: Chief, Division of Nutrition, Bureau of Maternal and Child Health, Pennsylvania Department of Health, Harrisburg.

Sybil Christensen: B.S., Utah State Agricultural College, Logan. Present position: Head Dietitian, Latter Day Saints Hospital, Salt Lake City, Utah; President, Utah Dietetic Association.

Janet Engebretsen: B.S., University of Wisconsin, Madison. Present position: Associate Dietitian, The Johns Hopkins Hospital, Baltimore; President, Maryland Dietetic Association.

Mable MacLachlan: B.S., Michigan State College, East Lansing; M.S., Teachers College, Columbia University, New York City. Present position: Director, Department of Dietetics, University Hospital, University of Michigan, Ann Arbor; President, American Dietetic Association.

Blake Bryson Patrick: B.S., Texas State College for Women, Denton. Present professional activity: President, Texas Dietetic Association.

Anne C. Platt: B.S., M.S., University of Washington, Seattle. Present position: Professor of Foods and Nutrition, University of Montana, Missoula.

Elizabeth E. Starr: B. Educ., University of California, Los Angeles. Present position: Administrative Dietitian, Harbor Hospital, Los Angeles County Department of Charities, Torrance, California.

Army Announcements Concerning Personnel

Elizabeth J. Stevenson was appointed a Medical Department Dietitian during May, 1947. She is a graduate of the University of Utah, and received her dietetic intern training at Lawson General Hospital, Atlanta, Georgia, and Brooke General Hospital, Fort Sam Houston, Texas.

The following Medical Department Dietitians were promoted during May, 1947:

Second Lieutenant to First Lieutenant

Bohn, Margaret D., R-2416
Boyd, Virginia M., R-2415
Heimerl, Januaria G., R-2452
Hollstein, Martha C., R-2441
Hvidston, Ruth M., R-2402
Kittams, Marguerite J., R-2464
Rogers, Lela R., R-2457
Rowe, Phyllis, R-2426
Sandmire, Corinne J., R-2436
Smith, Jeanne E., R-2417

The War Department has released the following official list of names of Medical Department Dietitians (not previously announced) who have been separated from service[1]:

Captains

Barker, Margaret E., R-640, 4252 First St., Riverside, Calif.
Bates, Helen L., R-456, Overbrook Station, Wellesley, Mass.
Chock, Mew U., R-1185, 54 Dewey St., Clinton, Mass.

First Lieutenants

Baggan, Mary V., R-2218, 192 High St., Woonsocket, R. I.
Burton, Carolyn G., R-2354, 1006 Virginia St., Martins Ferry, Ohio
Fisher, Viola, R-2347, Route #1, Post Falls, Id.
Goldschmidt, Lotte, R-2249, 538 S. Grant, Denver 4, Colo.
Hatch, Kathleen C., R-2104, Scipio, Utah
Hutchinson, Dorothy D., R-2080, 8 E. Manoa Rd., Brookline, Pa.
Knudson, Valdis, R-524, 3650 Broderick St., San Francisco, Calif.
Lagerstrom, Alice E., R-2331, 1720 N. 122nd St., Seattle, Wash.
Macedonio, Josephine V., R-2314, 35 Capitol Heights, Oyster Bay, L. I., N. Y.
Moran, Elizabeth T., R-2228, 1402 Jackson St., Scranton 4, Pa.
Murdick, Joyce, R-2355, 317 Myrtle Ave., Albany, N. Y.
Rau, Dorothy P., R-2269, 114 E. Sixth St., Thief River Falls, Minn.
Reed, Jessie A., R-2334, Winterthur, Del.
Reese, Ruth H., R-2351, 318 S. Burrowes St., State College, Pa.
Sleddon, Barbara, R-949, c/o Mrs. Frank D. Reid, Glenwood Garden Yonkers, N. Y.
Smith, Louise, R-196, Route #2, Box 354, Birmingham, Ala.
Stinson, Edna, R-250, Box 86, Ashdown, Ark.

Second Lieutenants

Johnson, Betty L., R-2437, 1905 Rolling Rd., Greensboro, N. C.
Knoblauch, Jeanne, R-2307, R.R. #1, Del Norte, Colo.
Middleton, Maude M., R-2339, Route #2, Walnut Cove, N. C.
Welch, Eileen P., R-2423, R.F.D. #3, Troy, N. Y.

[1] In the April issue of the JOURNAL, Elgevia A. Ball was incorrectly listed under separations as a 1st Lt. Miss Ball at the time of her separation held the rank of Captain.

Current Comment

THE FUNCTION OF A NUTRITIONIST IN A NUTRITION STUDY[1]

SUSAN B. MERROW

Research Associate, Department of Biochemistry, College of Medicine, University of Vermont

In organizing a survey of the nutritional status of a group, the problem of the function of the nutritionist must be decided. The writer's experience as nutritionist in a study of over 400 children in Burlington, Vermont, may be helpful in answering this problem.

Burlington, with a population of 31,000, is the largest city in Vermont. It is located on Lake Champlain about 40 mi. from the Canadian border, and the geographical location is important, as will be demonstrated later.

Our study was organized to investigate correlations between physical findings, laboratory findings of blood analyses, and food intakes of a selected group of school children, ages five to seventeen, having generally accepted signs of vitamin deficiencies (1) and to investigate the effect of vitamin therapy on these same children. Subjects come from five public schools, three parochial schools, and an orphanage.

The staff to carry out this work consists of thirteen people—the director, a biochemist; one full-time physician and four part-time physicians who do physical examinations and inspect for clinical signs of vitamin deficiencies and, as the study progresses, interpret and organize the data collected; a chemist and two technicians who do the blood, urine, and food analyses; a photographer; a secretary; one full-time nutritionist; and one part-time nutritionist.

How do the nutritionists fit into the team? What is their job, and how do they accomplish it? Their work in this study involves:

(a) Learning what the children eat.

(b) Calculating food intake from the diet histories obtained.

(c) Supervising the vitamin therapy.

(d) Planning and carrying out a nutrition education program and determining its effect on the food intake.

(e) Assisting in interpreting the results of diet evaluations, determining correlations with the physical and laboratory findings, and finally assisting in interpretation and writing the report of the study.

Let us consider each of these activities in turn. First, the diet history will be discussed (2). Since the diet evaluation will be based on this record, its reliability is most important. The periodic individual interview has proved the most workable procedure for the present study, and diet histories are obtained four times a year from each child. The child is asked to remember the food eaten in the last 24 hr. At first, we also asked about the frequency per week of each food named. For example, if a child reported eating an orange for breakfast, we asked whether this was unusual or if he had it every morning.

To test and evaluate these methods, a modest study was made on a group of children in an orphanage to compare the reliability of the one-day and the seven-day recall methods. The children were interviewed in the same way and the records checked against each other for consistency. It was concluded that although the per-week record may show a food intake more representative of an average day, its value is cancelled because it is less reliable and takes longer. It was interesting to note that there was little agreement in the report of the kinds of vegetables eaten during the week, yet there was fair agreement on the total number of times all vegetables were eaten per week. Apparently the child tends to identify mixed dishes and salads by the one item in the dish he likes best. For example, he may recall a cabbage-carrot-lettuce salad as merely lettuce.

Another study is being conducted with a group of fifty children. They were interviewed on three consecutive days to see how a three-day average compared with the one-day diet and the periodic histories obtained four times a year.

To calculate food intake properly, knowledge of amounts is important. Is a glass of milk 4, 6, or 8 oz.? How much does a serving of peas weigh? How big is a cookie, a 6-cent pie, a doughnut, an orange, or a slice of bread? How much peanut butter is in

[1] Presented at the meeting of the American Association for the Advancement of Science, December 27, 1946, in Boston, as part of the American Dietetic Association section on applied nutrition. This research project is supported by the Milbank Memorial Fund, the National Vitamin Foundation, Inc., Merck and Company, Inc., Eli Lilly and Company, the Vermont State Department of Public Health, and the College of Medicine, University of Vermont, with the cooperation of the Burlington public schools, the Burlington parochial schools, St. Joseph's Orphanage, and the Burlington Visiting Nurse Association.

a sandwich? How much meat is in a bowl of vegetable-beef soup? It was found that the child can express himself best and be more easily understood in terms of visual material, so dishes familiar to the children were provided to help them point out quantities. One glass in common use caused much trouble until it was found that it was a 12-oz. glass in which mustard had been sold just before the war. We also learned that soup is often served in a tin pie plate, vegetables in custard cups, milk in coffee cups, and cereal in vegetable serving dishes.

By going to the neighborhood stores patronized by the children's families standard weights for such items as sliced bread, packaged doughnuts, frankfurters, ice cream cones, brand name cookies and crackers, packaged rolls, cakes, and pies, can be obtained fairly easily. However, store managers may wonder what new kind of inspector it is who wants to weigh and measure his merchandise, and the nutritionist needs tact and a comfortable pair of shoes to complete the job.

She must also be familiar with markets during the period of the study and note changes that may affect the diet evaluations. One example during the spring of 1946 was the change to 85 per cent extraction flour and the reduction in the weight of a slice of bread.

It is also important to know local food habits and meal patterns, and the nutritionist cannot be expected to start interviewing until she has acquired some of this information. Food combinations, recipes, and names of food are different in different localities. For example, several varieties of fresh water fish, game, and maple sirup are often found in the dietary in Vermont. One popular dish is a casserole of canned corn, canned kidney beans, and hamburger. Some Vermonters eat for dessert a sauce dish full of plain maple sirup with soda crackers. Another favorite dessert is boiled rice with cream and maple sirup. Goulettes are eaten for breakfast and bull-pout for lunch. We also found that the influence of French-Canadian food habits is frequently reflected in the foods eaten.

An understanding of the local dialect is another essential, particularly when working with children. They are frightened and bewildered by unfamiliar terms. In Burlington, for instance, a soft drink is a "sodee." If you ask about bread only, you may never learn about the six slices of toast a child may have eaten. Baked beans are "home made." "Canned" beans are baked beans bought in a can. "Macaroni soup" is canned tomato soup with macaroni added. "Lunch" is a snack between meals; "dinner" is the noon meal; "meat" may be either salt pork or lean meat; "dessert" usually means ice cream, and any other dessert is called by its own name.

Between-meal eating adds considerably to the day's total intake. Determining the amount of money spent for candy seems to be the best way of estimating the consumption of that item, but it must be borne in mind that nuts and raisins used to stretch the sugar increases the food value considerably.

The reason for such questioning must also be explained if cooperation is to be obtained. Otherwise, the subjects will wonder what business it is of ours what they did or did not eat. Without active cooperation on the part of the children we might never have learned of one mischievous boy's appropriating a jug of cider from a Halloween party and sharing it with two friends. Another child told of taking fruit from the box cars of a local wholesale produce company, while another told us that with the pennies he obtained from turning in illegally obtained beer bottles, he bought "cakes and sodee."

After the diet history has been obtained, the next step is to find out the nutritive value of the food intake. We are using the values prepared by the Bureau of Human Nutrition and Home Economics in cooperation with the National Research Council (3) in making our calculations. Although these seem to be the most usable tables for our purposes, there are still a number of points which must be considered in making calculations. What percentage of the total iron reported is available? Does the ascorbic acid value include the dehydro-ascorbic acid? An arbitrary figure has been used for the conversion of the vitamin A-active carotenoids to International Units of vitamin A. It is felt, however, that although the validity of individual calculations may be questionable, differences between the records should be significant if the same values are used consistently in all calculations.

However, these values are in terms of raw food. We know there is destruction and loss of nutrients in cooking. A figure for percentage loss must be determined and the figures adjusted. The history is in terms of slices, cups, pieces, and so on, while the tables are in units of weight. This means another step in the conversion of the original record.

Local recipes for mixed dishes were obtained from a restaurant, a school lunch program, and a cook book of local recipes, and from these, average composition figures were calculated. This was done rather than attempting to obtain individual recipes from each family, an impossible task under the existing set-up of the study. Information was obtained from bakeries as to the percentage of whole wheat and white flour used in their dark breads, but the nutritionist did her own calculations to determine the food value of one slice of bread. One set of figures for a group of foods that do not contribute a significant amount of any one nutrient may be used, but this will entail a study of the frequency with which each item appears in a sample group of records. For example, if food values are being determined for a group such as "other vegetables," canned peas may occur three times as often and beets one half as many times as string beans. The nutrient values

must be weighted accordingly in calculating the average figures to be used for one serving of "other vegetables." Thus, final figures will be more representative of the actual food eaten.

Commercial companies have been of considerable help in supplying recipes of canned and packaged foods. An ice cream company was most helpful in giving formulas for "fudgikles" and frozen custard, two items that the children from one neighborhood eat frequently. However, the nutritionist still must buy samples, weigh them, and decide on the food value of the unit as sold to the children. The manufacturer was of little help in learning the vitamin values of canned soup eaten frequently and in large quantity. To determine this information, we bought sample cans of the soups and weighed the liquids and solids. Using this same method, a popular brand of canned mixed vegetables was found to contain two parts of carrots to one part of a mixture of seven other vegetables, and the vitamin A value was much higher than if an equal amount of each vegetable listed on the label had been calculated. Chemical analysis of the food items would be the ideal method to determine these figures, but this quantitative method, we feel, gives approximate measures.

How much detail is necessary? Since at best the original diet history is only an approximation of the food intake, because it is based on the child's memory modified by what he has learned about adequate diet in school and his reaction to the interview, too great detail in calculation will give a false appearance of accuracy. All foods containing significant amounts of the nutrients being studied are handled separately, and the figures should be checked.

One check to determine the reliability of the calculations was a 24-hr. balance study done on six children on six different days. The chemical analyses of the sample meals were compared with the calculated figures of the same meals. The values differed considerably with those obtained by calculation as reported by other workers, but the difference was fairly consistent. As a result, we feel that the methods of estimating the content of mixed dishes and figures used are workable for the needs of our study. Although calculation gives merely an indication of the adequacy of the diet, we do hope to obtain a fairly reliable picture of the differences in the food values of the diets by this method.

The third part of the nutritionist's work concerns the vitamin therapy experiment. The children are paired into test and control groups on the basis of physical signs of vitamin deficiency; extent of progress in chronic process, whether or not there is superimposed an acute or subacute condition; sex; and age.

Next, the problem of distribution of the vitamin therapy was worked out. The vitamins are distributed once a month to the teachers in the schools and to the matrons of the orphanage. This gives the nutritionist an opportunity to check with the teachers and note any children who have transferred to another school or moved away. Also, this contact with the teachers is important, for their attitude toward the study is reflected in the cooperation of the children. Since classes are often disturbed when the children are taken out for physical examinations, blood samples, pictures, or nutrition histories, frequent interpretation and explanation of the program is a small but vital part of the nutritionist's work.

One group of fifty children were given vitamin therapy during the summer. Once a month each child was given an appointment at the Visiting Nurse Association to pick up the next month's supply of vitamin pills and to leave his report of the days he had taken or missed the therapy. Half of the children kept these appointments; the vitamins for the rest of the children were delivered to the homes. This served also as another excellent opportunity to explain the study to the parents.

Packing the pills has been no small job. Since the placebos look exactly like the therapy, this must be done carefully, and we have found that weighing the pills is the most satisfactory method of counting. For example, we use 10,664 2-mg. tablets of riboflavin per month.

The nutrition education part of the nutritionist's work will come later, for this cannot be planned until we know the results of the food intake evaluations. One direction that this program may take, however, will be along budgeting lines. If inadequate diet is the cause of the vitamin deficiency symptoms and the family is to take the responsibility for improving the diet, they must be taught how to do this at a minimum cost. The child himself may be another avenue of approach, for he can be shown how to use his spending money and the implications of his likes and dislikes. School lunch programs, the department of public health, or the use of vitamin supplements added to the daily diet, are other possibilities. To plan an educational program with children will mean grading of nutritional material for the different age groups and the obtaining of visual aids and cooperation of the teachers.

The fifth part of the nutritionist's work—the interpretation of the data; determining correlations, their significance and insignificance; and writing up the results—is a science in itself and requires as much if not more time than that involved in the collection of the data. As with all research workers, we hope to make a positive contribution to the the field. However, we must also be prepared for "a successful failure."

Many of the details of this survey have been included in this paper, for the accumulation of accurate data is a significant part of scientific research. These are some of the details peculiar to the work of a nutritionist in nutrition research.

What, then, is her function? She is the middle man between the art and the science of nutrition. She puts the language of the kitchen into the objective language of science, and then translates the scientific terms into everyday language for the layman. In this way she aids the progress of science and promotes its benefits to mankind.

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(1) Council on Foods and Nutrition, American Medical Association: Vitamin deficiencies: stigmas, symptoms and therapy. J.A.M.A. 131: 666, 1946.

(2) Committee on Food Habits: Manual for the Study of Food Habits. National Research Council Bull. No. 111, January, 1945.

(3) Bureau of Home Economics and Human Nutrition in Cooperation with National Research Council. Tables of food composition in terms of eleven nutrients. U.S.D.A. Misc. Pub. No. 572, 1945.

FOOD SERVICE IN A PRIVATE CLUB[1]

HELEN L. CORBITT

Dietitian, Houston Country Club, Houston, Texas

Every field of food service presents opportunities that might cause the food director to say that her work offers the most possibilities, is the most interesting, or is the most satisfying. For sheer excitement and the opportunity to express your own personality, however, I believe that club food service reaches a zenith. From a scientific viewpoint, the far reaching influence of quality food, both from planning and preparation, has no bounds. The patrons of a private club usually serve on governing boards of all types of institutions, both in industry and in hospitals. They can and do demand more from the food directors of these organizations because of the appeal of good food in their clubs.

Club food service is particularly stimulating for several reasons, the most important of which I feel is the attitude of the clientele. Eating to them is not, for the most part, something that must be done; patrons of a club consider it a habit which must conform to the art of graceful living. Any food director in a private club must, therefore, have a keenness of perception in order to create an eagerness on the part of her clientele for new dishes and for smooth, detailed service. She should have a feeling of inspiration rather than of duty in carrying out her work. As a rule, club patrons are eager for the usual rather than the unusual, but it must be served with a definite flair of the imagination.

Despite present-day difficulties of food shortages and personnel problems, we must not forget the fundamentals of food service. Dietitians have all been trained to serve hot foods hot, cold foods cold, to time preparation activities according to the time the food is to be served, and to season food properly. Many of us today are forgetting these rules for the following reasons:

(a) Fatigue from battling with labor and supply problems.

(b) The new idea of directors directing from a desk far removed from the scenes of preparation.

(c) The lack of appreciation for employee endeavor.

(d) Recently, a lack of enthusiasm to make the best of difficulties.

(e) The lack of a sense of humor to meet the upsurge of business due to more money in circulation and the homemaker having a hard time to find either food or help.

We must take these points into consideration to be successful in any food job, but in a club when catering to a discerning clientele, it is even more important. Today, more than ever, sales appeal through a well planned menu is a challenge and a problem. To achieve this, let us consider:

(a) A thorough knowledge of the skill of the employees. Their limitations must be recognized and the menu planned accordingly.

(b) The menu must sound appealing. If the menu reads smoothly, the patron will be conscious of the care given to it. The use of simple, descriptive terms, rather than foreign and cuisine terms that the average person does not understand, makes a menu sound appetizing and appealing.

(c) The average "eating out" clientele is educated to good nutrition, but does not want to be particularly reminded of it. The provision of a well balanced menu with generous quantities of vitamin- and mineral-rich foods can be done easily.

The dressing up of fresh vegetables with new terms and seasonings is a simple matter. For example, patrons clamor for more when the menus include potatoes cooked in their jackets, garlic buttered crumbs, or fresh herbs added to any green vegetable. Popularizing nutritious foods of a particular locality is also easy to do and popular with customers. For instance, blackeyed peas (popular in Texas) which have been boiled and soaked in olive oil, garlic, and wine vinegar make a delectable hors d'oeuvre. Salads can be made more attractive if made from good, cool, crisp greens, with the addition of different types of vegetables and fruits, and if served with a well seasoned and appropriate dressing, and are preferable to salads made hours ahead of time.

Proper meat cookery is a "must." Surely everyone knows that meats are ruined more times by poor preparation than perhaps any other item on the menu. Broiled meats must be served from the broiler to the patron as one operation. Cooking of roasts must be timed so that they come out of the oven as needed, eliminating the necessity of reheating. The difference between roasting and braising must not be forgotten, either. The less tender cuts of meat

[1] Presented at the 29th Annual Meeting of the American Dietetic Association on October 18, 1946, in Cincinnati.

can be made popular if thought is exercised in the use of new seasonings or if wine is used in making gravies, or if they are served with flaky biscuits or bouquets of various vegetables.

In purchasing foods for such a menu, which is designed primarily to appeal to the palate, we must remember that there is no substitute for quality and we must always insist on the best that can be procured. If we let down our standards, the purveyors will do likewise.

The serving problem—that is, getting the food from the kitchen to the patron—is one we cannot afford to overlook. The "I don't care" attitude has gripped the nation, especially in food services. It *is* difficult to obtain proper china, silver, and linens, but we *can* see that the china is not chipped, silver and glassware are well polished, and the linen spotless, and that all are put on the table with care. The niceties of service that are not expensive and which do not entail extra labor, such as icing fruit and seafood cocktails, the passing of relishes and hot vegetables, carving roasts in the dining room, serving hot breads that are hot, and the ever-present attempt to have the food look as if it has been prepared and served "especially for you" takes only time and supervision.

Fresh flowers or green arrangements brighten up both the dining room and the appetite. They should not be merely stuck in a vase, however; effort should be made to achieve different and unusual arrangements. Themes of service should be emphasized. For instance, if serving a Mexican dinner, use Mexican or colored pottery, Mexican colors in choice of flowers and linens, and Mexican music if possible. Have the dessert, which is usually candy and fruit, passed by a waiter or waitress in Mexican garb. Try to catch something peculiar to the place in which you are serving and feature it. For instance, feature window tables that look out upon a beautiful scene, an unusual tree, or a brook; take advantage of the wild life outside—birds, squirrels, the smell of honeysuckle—and patrons will demand these tables. The temper of the most difficult person to please can usually be mollified with something like this. All these, which are in themselves simple, are rudiments of good service that can be achieved with a little thought, well timed and placed.

Club service for the most part consists of catering to groups of individuals with varied tastes and ideas. For instance, one day's activities may include an overall picture of diversified interests that is staggering: a mid-morning "coffee" for 150 people in the main lounge; a business meeting of 200 for a society sponsored by a member, for which lunch is requested; a buffet lunch for a teen agers' party with the usual "hot dogs" and hamburgers, but served in an unusual atmosphere at the swimming pool; several small luncheons for bridge or mah-jongg players; "on-the-fly" food at the men's grill for golfers who wish to be seated, served, dressed, and "on the tee in 10 min."; an hors d'oeuvre table for a cocktail party; refreshments for a children's birthday party; a formal dinner in a private dining room for a group that may be entertaining a visiting celebrity; an informal dinner for a group of 100 in another secluded room; a wedding reception for 600 to 700 guests; an informal dance with supper at midnight which will require all-afternoon preparations; and during all this, meals for regular diners who must be served and who expect the same interest and service.

You may say that this goes on in a hotel every day. However, a hotel is departmentalized, while a club has a small working personnel which must carry out at all times a homelike atmosphere. Each person or group must have individual attention; flowers, decorations, and entertainment must be planned and carried out with no apparent effort on the part of the entertaining hostess or the club manager.

The organization of such a department and the personnel to carry out an idea from its conception to its service to the client means long hours. It is not a nine-to-five job. But it *is* satisfying, for you are catering to people who have not forgotten the art of saying "please" and "thank you" for a job well done.

THE POTATO SITUATION

T. SWANN HARDING

The Department of Agriculture recently published a study of the nutritive value of our per capita food supply from 1909 to 1945 (1). It clearly showed that the public has quite generally accepted the newer knowledge of nutrition. During this period the consumption of dairy products, butter excepted, has risen steadily. The same may be said for eggs, with some ups and downs. Consumption of meat, poultry, game, and fish, has fallen slightly, and that of fats and oils, including pork fat and butter, after rising, finally dropped to about the level of 1909.

Consumption of dry beans, peas, soybean flour, and nuts has risen sharply and that of citrus fruits and tomatoes has gone up tremendously. While the consumption of fruit has slightly declined, that of the leafy green and yellow vegetables which contain the protective food elements has risen. Consumption of food grain products, sugar, sirups, potatoes, and sweet potatoes has declined. The food energy or calories in the diet is now lower than at the beginning of this period, and the level of protein has been about maintained while that of calcium, iron, and vitamins has risen.

The decline in potato consumption becomes of particular interest just now for the United States is experiencing another potato glut. We are in the process of throwing away 20 million bu. of potatoes which could not otherwise be used, and consoling

ourselves that the $80 million lost by the government in its price supporting operations may eventually be wholly retrieved through the federal tax on the alcohol made from some of these potatoes. Why did this happen? The answer divides into three parts:

(a) The technological revolution in agriculture which took place during the war has shown us how to produce more of all sorts of crops at less cost in time, money, and effort.

(b) Consumers are eating about 15 per cent less potatoes than they were before the war.

(c) The law compels the Department of Agriculture to support potato prices even if many of the resultant potatoes must be dumped.

Producers who exceed quotas or farm allotments for so-called basic commodities are penalized for marketing their excess and may obtain loans on the excess at reduced rates. However, there is no production control over non-basic crops, of which potatoes is one. Nevertheless, the Secretary of Agriculture publicly announced that increased production of these non-basic crops was needed to win the war, and the law directs that their prices be supported at 90 per cent of parity, or of a comparable price, until December 31, 1948. The major problem crops in this group are potatoes and eggs, and we had a potato surplus even in 1945, immediately after the victory over Japan when the armed forces stopped buying so many.

Thereupon, the Department of Agriculture moved in, started buying, and disposed of the excess potatoes for by-product, relief, or livestock-feed purposes or for direct sale to France, Belgium, or Canada. Prices were supported as the law required and $15 million was the loss. In 1946 the Department of Agriculture tried to avert trouble by recommending a smaller potato acreage and limiting price supports.

Actually 100,000 fewer acres of potatoes were planted in 1946 than before, but there was a shift to high-yielding areas which experienced good weather, and the growers put fertilizers, new cultural methods, insect and potato disease control to good use. The result was a yield of 184 bu. of potatoes per acre, as compared with an average of 124 bu. for 1934 to 1943, and a previous all-time high of 155 bu. The 1946 acreage was smaller than that of 1928 by one fifth—the smallest since 1892—yet the crop was 475 million bu.!

The potatoes simply could not be disposed of, partially because the public has become accustomed to eating fewer potatoes. Military orders were still for smaller quantities. Potatoes could not be shipped for relief abroad for they spoiled in transit. If dehydrated and shipped for relief, they became very expensive food and those in need of relief were not able to buy expensive products. There is a limit, too, to the capacity of plants which convert potatoes to starch or alcohol. So it was that 20 million bu. of potatoes went to waste, and, because the law so required, $80 million were required for price support.

REFERENCE

(1) Bureau of Human Nutrition and Home Economics in cooperation with Bureau of Agricultural Economics: Nutritive Value of the Per Capita Food Supply, 1909–45. Washington: Dept. of Agriculture, 1946

New Appointments, Veterans Administration

The following hospital appointments of dietitians (not previously announced) have been made by the Veterans Administration.

Name	Position	Location
	Branch No. 2	
Kathryn McHale	Staff Dietitian	Bronx, N. Y.
Marjorie Murphy	Staff Dietitian	Staten Island, N. Y.
	Branch No. 4	
Harriet Magoon	Staff Dietitian	Ft. Howard, Md.
	Branch No. 6	
Annabel Rickard	Staff Dietitian	Cleveland, Ohio
	Branch No. 7	
Mary Armstrong	Head Dietitian	Marion, Ind.
Alva Burtch	Staff Dietitian	Hines, Ill.
Edith Goldstone	Staff Dietitian	Hines, Ill.
	Branch No. 10	
Ruth Deacon	Staff Dietitian	Waco, Tex.
Ruth Grijalva	Staff Dietitian	McKinney, Tex.
	Branch No. 12	
Marion Irvine	Staff Dietitian	Los Angeles, Calif.
Barbara L. Northrup	Staff Dietitian	Livermore, Calif.
	Branch No. 13	
Mary E. Burch	Staff Dietitian	Ft. Lyon, Colo.

Book Reviews

Rehabilitation Through Better Nutrition. By Tom D. Spies, M.D. Philadelphia: W. B. Saunders Company, 1947. Cloth. Pp. 94. Price $4.

This monograph is intended for the practicing physician and other students of medicine as an exposition of practical therapeutics which will aid in the study and application of clinical nutrition. The goal is said to be "full rehabilitation of every patient with nutritive failure." Lest the physician be misled with the term "rehabilitation," the author points out that it is concerned wholly with long-term application of the principles of nutritive therapy which would make it possible for the malnourished to regain health and to perform work. "The physician should not consider his patient adequately treated until good health is regained and maintained."

Much of the book is devoted to actual findings and illustrations of patients with nutritive failure. Deficiencies of vitamin A, niacin, thiamine, riboflavin, ascorbic acid, and other vitamins are described as well as anemia, pernicious anemia, nutritional macrocytic anemia, hypochromic microcytic anemia, non-tropical sprue, and protein deficiency.

While importance is attached to food in the treatment of nutritive failure, it is pointed out that it was not considered feasible to include all of the variations in the dietary recommendations that are *necessary* to the individual case. For this reason, only four examples of diets are given "with the hope that the practicing physician will find them useful as a basis for prescribing diets for rehabilitating persons with nutritive failure." A 4000-calorie liquid, semi-solid, and solid diet; and an 1800-calorie diet are very briefly outlined.

In view of the reliance that must be placed on adequate food intake in the long-term treatment of the patient, the physician will certainly have additional needs for data on food composition, an understanding of interchanges in foods, and the elasticity to adapt his dietary recommendations to the socio-economic needs of the patient. For those physicians who might wish to be adequately implemented to accomplish the goal of treatment as outlined by the author, it might have been helpful to supply references to sources of reliable information concerning dietetics and food therapy.

Modern Swedish Cookbook. By Anna Olsson Coombs. New York: Current Books, Inc.; A. A. Wyn, publisher, 1947. Cloth. Pp. 196. Price $2.50.

Swedish cooking has gained an enviable reputation with many people. However, many Swedish dishes have not been prepared in the average American home because satisfactory recipes have not been available. Consequently, this interesting book will be welcomed by the collector of unusual but practical recipes.

Mrs. Coombs, who recently visited Sweden, has gathered many of the typical recipes of this Nordic land, tested them, and adapted them to modern cooking methods. Fortunately, the typical, unusual flavors of the various foods have not been lost in simplification. Wines, spices, and herbs are often the secrets of the delicious recipes, and the French influence is plainly seen, especially in the meat and fish sauces.

Throughout the book, comments are made on Swedish customs related to different foods. Seasonal dishes, such as Christmas *glögg*, *lutfisk*, and *kalv sylta*, are described. The Swedish national Thursday-dinner dish of split pea soup and pancakes is not forgotten; nor is the popular *smörgåsbord*. Cookies and coffee cakes, essential to the coffee table, are given their share of attention.

It is true that this book is not the only acceptable interpretation of modern Swedish cooking. However, all of the recipes, from soups to desserts, are representative of the country and can be used to add flavor and interest to our American menus.

Korean Recipes. By Harriett Morris. Wichita, Kansas: Harriett Morris (1155 North River Blvd.), 1945. Paper, spiral bound. Pp. 50. Price $1.00.

The author is a home economics graduate of Kansas State College and has spent twenty years at Ewha College for Women, Seoul, Korea, where she became enthusiastic about Korean food and food preparation. She collected information and ideas from her students, from her Korean friends, from the servants, and from the men in the markets. She learned to enjoy all kinds of foods and dishes and gradually built up a file of recipes which might be used in the United States. Her recipes were standardized and checked in Korea by students and re-checked in Wichita. Now they are available in printed form and are illustrated by prewar photographs showing demure Korean students at every activity from cleaning bean sprouts to serving dessert.

There is much to interest the American reader in this cook book. For instance, she will be impressed by the number and variety of the recipes for vegetable preparation, such as the several ways to cook spinach and cabbage.

Like the Chinese, the Koreans take full advantage of vegetables at their disposal and are perhaps wiser than many Americans in having a good variety on hand much of the year. Concern about vegetables is revealed by one of the Korean proverbs which Miss Morris quotes: "Small, but never-the-less a pepper seed."—*Martha Kramer, Ph.D., assistant dean, School of Home Economics, Kansas State College, Manhattan.*

Expectant Motherhood. By Nicholson J. Eastman. 2nd ed. Boston: Little, Brown and Company, 1947. Cloth. Pp. 198. Price $1.50.

In the preface, the author, who is professor of obstetrics at Johns Hopkins University and obstetrician-in-chief for Johns Hopkins Hospital, voices an appreciation to Eloise R. Trescher, director of the Food Clinic, saying, "Her many years' experience with cases of excessive weight gain has given her an unusual insight into the dietary problems of expectant mothers—an insight which is reflected time and time again in Chapters III and IV."

In line with the increased recognition and application of the principles of nutrition and diet during pregnancy, an amplification has been made in this second edition, and a new chapter has been added on the restriction of the diet to avoid an excessive gain in weight.

Dietary recommendations are correlated with sound explanations of body needs. Details regarding the selection and preparation of foods are given clearly, simply, and in a form which can be readily suited to the needs of the preg-

nant woman and her family. The other important details of hygiene during pregnancy are covered in the same clear, practical, and understanding manner.

Dietitians will be interested in the expert handling of this subject and in the possibilities of this book for a "reference" for expectant mothers and fathers who wish to have an authoritative and reassuring guidebook throughout pregnancy.

Fannie Engle's Cook Book. By Fannie Engle. New York: Duell, Sloan and Pearce, Inc., 1946. Cloth. Pp. 186. Price $2.50.

This is the kind of book that could easily take first place on the amateur housewife's bookshelf. It has everything in it to help and guide the housewife. There is a brief resumé of vitamins, several pages of marketing advice, giving grades, signs of quality, and what to look for in selecting various foods, and a complete glossary of cookery terms. There are pointers on recipes and ingredients and helpful hints on setting the table. Especially good are the suggestions for company meals, with sample menus and very complete working plans for meal preparation.

There are more than 1500 recipes, including everything from appetizers through to desserts, candy, and preserving, with a special chapter on the use of leftovers. The recipes are clearly presented and easy to follow. The emphasis is on economy both of time and of money. The food is everyday, simple food, but it is prepared in a new and different way, making for tempting variety. The recipes will be intriguing to the experienced as well as the amateur cook.—*Lila Hainer, Sheboygan, Wisconsin.*

Clinical Biochemistry. 3rd ed. revised. By Abraham Cantarow, M.D., and Max Trumper, Ph.D. Philadelphia: W. B. Saunders Company, 1945. Cloth. Pp. 647. Price $6.50.

Extensive supplementation and revision of material presented in the second edition, and a number of new topics have been added to this textbook to bring it up to date. Included in the additions are: the intravenous glucose tolerance test; the insulin tolerance test; present views regarding ketosis; abnormal serum globulin reactions; present views regarding gastric and pancreatic secretion; and new methods for the study of deficiency in vitamin A, thiamine, riboflavin, nicotinic acid, ascorbic acid, and vitamin K.

Textbook of Physiology. 9th Ed. By William D. Zoethout, Ph.D., and W. W. Tuttle, Ph.D. St. Louis: The C. V. Mosby Company, 1946. Cloth. Pp. 723. Price $4.75.

In revising this textbook of long-standing, more than one half of the text has been rewritten. Extensive changes have been made in the material covering the various phases of metabolism, and several timely topics, including folic acid, have been added. Several new black and white illustrations are also used, as well as three new color plates.

Toxicity of Vitamins

If given in relatively large amounts, certain of the vitamins have been shown to produce evidences of toxicity or death. The ratio of the quantity required daily for optimum nutrition to the lethal or toxic dose, in the experiments cited on animals, varied from 1:600 for 2-methyl-1, 4-napthoquinone to 1:60,000 for pyridoxine. The ratio was 1:2000 for vitamin D; 1:5000 for niacin; 1:7500 for vitamin A; and 1:25,000 for thiamine.

Sufficient latitude in dosage would seem to exist for each of the vitamins to preclude similar effects from administration to man in quantities appropriate for nutritional requirements. Yet these substances are readily available and are often administered in quantities far exceeding daily requirements. Evidences of hypervitaminosis A, D, and K have been observed in man and are recorded in the literature. It is important, therefore, to keep in mind that toxic doses can and have been given.—*Nutrition Reviews 5:49, February, 1947.*

Meeting for Blind Canteen Operators

The Pennsylvania State Council for the Blind and the Production and Marketing Administration of the Department of Agriculture recently sponsored a workshop for blind canteen operators who have concessions for serving food in small industrial plants. The meeting, held in Philadelphia, was attended by twenty such operators, as well as some wives, canteen assistants, and Seeing Eye dogs.

During the two evening sessions and one all-day meeting, the operators discussed their problems and received suggestions on all phases of their operation, including menu planning, purchasing, cooking, serving, sanitation, bookkeeping, and equipment. The blind operators were especially interested in types of food which they could serve successfully and arrangements of equipment for their convenience. They brought plans of their canteens and specialists from the Department of Agriculture suggested improvements, using plans which the operators could "picture" with their fingers.

As a result of this workshop, a guide for canteen operators, prepared by these specialists, will be published in braille and also will be mimeographed by the Pennsylvania State Council.

Current Literature

Contributed by Janette C. Carlsen, Janet E. Engebretsen, and Ethel M. Miller, Dietary Department, The Johns Hopkins Hospital; Lorraine G. Weng and Marian T. Straube, University of Chicago Clinics; Mrs. Marjorie M. McKinley, Women's Educational and Industrial Union, Boston; Martha Trulson, Veterans Administration, Chicago; and the Journal staff.

THE AMERICAN JOURNAL OF DIGESTIVE DISEASES

Vol. 14, April, 1947

* Nutritional survey at a children's institution; incidence of avitaminotic lesions and effects of therapy. M. S. Biskind and R. R. Williams.—p. 121.

Avitaminosis Lesions and Effects of Therapy. Examination of 183 boys in a children's institution revealed an unexpectedly high incidence of signs and symptoms of nutritional deficiency. Approximately 90 per cent had glossitis, 67 per cent had gingivitis, 19 per cent had cheilosis, and 60 per cent had avitaminotic symptoms related to the nervous system. Routine nutritional therapy with the B vitamins, ascorbic acid, and vitamins A, D, and E, was given to all but a few of this group during a seven-month period. Complete disappearance of the symptoms of deficiency in most of the affected resulted and improvement in all but a few of the residual group. This study supports the view that examination for and adequate treatment of the stigmas of nutritional deficiency should have a high priority in routine medical care. Color illustrations are included.

THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES

Vol. 213, April, 1947

* Renal excretory function and diet in diabetes insipidus. S. B. Beaser.—p. 441.
* Changes in personality appraisal associated with a restricted intake of B vitamins and protein. C. R. Henderson, N. C. Wheeler, H. C. Johnson, R. C. Cogswell, Jr., G. H. Berryman, A. C. Ivy, T. E. Friedemann, and J. B. Youmans.—p. 488.

Diet in Diabetes Insipidus. From the experiment reported in this study as well as from reports of eight other patients, dietary control seems worthy of trial in diabetes insipidus. Both salt and protein need to be restricted in order to obtain the maximum therapeutic benefit. It was shown how low the concentrating power is of the diabetic; a new quantitative definition of severity in this disease is proposed in terms of renal excretory dysfunction.

Personality Changes on Restricted Diets. Seven young male volunteers were tested to ascertain what changes might occur on low-protein and low-B-complex diets (40-gm. protein diet with very low vitamin B allowance). At the end of five weeks on this regime, two of the subjects were given crystalline B-complex vitamins and a protein supplement to bring their intake up to normal. Other subjects were given supplements at various periods during the trial. Changes did occur in the triad of hysteria, hypochondriasis, and depression. As personality changes were noted, physical and psychomotor performance, resting pulse rate, and diastolic pressure variations occurred. When supplements were added to the test diets, recovery began, and normal scores were attained by the subjects following a final three-week period when a luxurious diet was served.

THE AMERICAN JOURNAL OF NURSING

Vol. 47, May, 1947

* A "clean" procedure for formula preparation. M. A. Mitchell.—p. 304.

Formula Preparation. Formula preparation at Wesley Memorial Hospital, Chicago, is carried out in a simple and safe manner. Since feedings have been made under clean procedure and autoclaved, the incidence of gastrointestinal disturbances has been reduced considerably. Descriptions of equipment, explanations of procedures, and illustrations help to present a clear picture of the daily routine.

THE AMERICAN JOURNAL OF PHYSIOLOGY

Vol. 149, April, 1947

* The effect of insulin on food intake after vagotomy and sympathectomy. M. I. Grossman, G. M. Cummins, and A. C. Ivy.—p. 100.
* The influence of test meal composition on gastric emptying in man. A. Henschel, A. Keys, A. M. Sturgeon, and H. L. Taylor.—p. 107.
* Further observations on factors influencing the biochemical appraisal of nutritional status. G. H. Berryman and C. R. Henderson.—p. 142.

Effect of Insulin on Food Intake. It has been assumed that hunger sensations and increased food intake are the result of increased motor activity induced by insulin. It has been demonstrated that vagotomy abolishes the gastric motor response to insulin. It was found that insulin causes an increase in food intake both in normal dogs and in dogs with extrinsically denervated stomachs. This finding strongly suggests that insulin hypoglycemia acts directly upon the brain to excite food-taking activity.

Test Diet and Gastric Motility. The influence of the nutrient composition of test meals on gastric motility was observed in eight normal young men. In the variations of the basic oatmeal test meal, part of the oatmeal was isocalorically replaced by fats, protein, or carbohydrate. The results indicated that within nutritionally reasonable limits, increasing the proportion of the calories in the test meal supplied by fat, protein, or carbohydrate did not significantly alter gastric motility. The rate of gastric emptying during the first 90 min. of the emptying phase cannot be used as a reliable index to predict the final gastric emptying time in individual cases.

Biochemical Appraisal of Nutritional Status. The lack of correlation that may occur between a few urinary excretion levels of nutrients and measures of physical and psychomotor performance is shown. An even greater discrepancy could occur in the case of a single biochemical reading. It is concluded that biochemical data, such as the urinary excretion level of nutrients, are a valuable tool in nutritional appraisal, only if used in conjunction with other types of data—clinical, physical, psychomotor, and dietary. If used alone they may mislead, not only because they are influenced by previously attendant factors such as recent dietary intake, normal variation found among individuals, and environmental factors, but also because there may be a lag between changes in biochemical levels and corresponding changes in physical and psychomotor performance.

THE AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 27, April, 1947

* Problems and errors in assigning causes of bacterial food poisoning. G. M. Dack.—p. 360.
* Inactivation of the virus of infectious hepatitis in drinking water. J. R. Neefe, J. B. Baty, J. G. Reinhold, and J. Stokes.—p. 365.
* Dishwashing practice and effectiveness in a large city as revealed by a survey of 1,000 restaurants. H. J. Kleinfeld and L. Buchbinder. —p. 379.
* Critical study of machine dishwashing. W. L. Mallmann, P. Dekoning, and L. Zaikowski.—p. 390.

Causes of Bacterial Food Poisoning. Many kinds of microorganisms have been alleged to cause food poisoning merely because they have been found in large numbers in implicated foods or in the vomitus or stools of patients. Some of these bacteria are natural inhabitants of the intestinal tract of healthy persons, and there is no reason other than the circumstantial evidence cited for assigning them causative roles in food poisoning. Another error is the failure to exclude known food poisoning bacteria or their products as the cause of illness. Aside from botulism and staphylococcus food poisoning which are caused by toxins preformed in food, other outbreaks of food poisoning follow the ingestion of living organisms. The evaluation of the significance of a bacterium as an etiological agent in food poisoning is complicated when the organism is frequently found in the normal intestinal tract or is a wide spread saprophyte. A few outbreaks described in the literature are tabulated to illustrate some of the problems concerned with assigning bacterial agents as causes of food poisoning.

Virus of Infectious Hepatitis in Drinking Water. The effect of certain procedures, commonly employed in the disinfection of drinking water, on a virus of infectious hepatitis has been investigated. Coagulation, settling, and filtration of contaminated water did not eliminate or inactivate the hepatitis virus as shown by the fact that the disease developed in 40 per cent of the volunteers who ingested such treated water. The complete control of the hepatitis virus in drinking water depends almost entirely on the disinfectant, since the virus is not eliminated or inactivated by preliminary coagulation, settling, and filtration of the water. The efficiency of the disinfectant varies with the character of the water and the resistance of the infectious agent concerned. Dosages of chlorine that are adequate for inactivation of the bacterial pathogens occurring in drinking water may not be adequate for the hepatitis virus.

Food Utensil Sanitation. A survey of dishwashing practice was carried out in 1005 restaurants in New York City. About 88 per cent of establishments used hand methods either entirely or in part, and 17.5 per cent used machine methods entirely or in part. The quality of washing as measured by the swab-rinse test was found in general to be very poor. Evidence is presented which indicates that unsatisfactory conditions are not peculiar to New York City but also exist in other sections of the country. When the practices in the three types of restaurants studied were compared, it was noted that both hand and machine washing in cafeterias was generally inferior to that in waiter-service restaurants and in luncheonettes. After evaluation of the present and possible future status of hand washing, the conclusion seems justified that hope for satisfactory dishwashing practice lies in conversion to machine or manual-mechanical practice.

Machine Dishwashing. A rinse period of 10 seconds at 170° F. is proposed for single tank dishwashing machines. A technique, using *M. caseolyticus* as a test organism, is presented for measuring time and temperature of rinse. Two methods of determining thermal death points of bacteria are described: a food soil devised for measuring the efficiency of dishwashing machines is presented, and a bacteriological method of measuring the efficiency of dishwashing machines is given. A test plate to be used by sanitarians in checking dishwashing machines is also described.

ANALYTICAL CHEMISTRY

Vol. 19, April, 1947

* Vitamin B_6 group. Extraction procedures for the microbiological determination of vitamin B_6. J. C. Rabinowitz and E. E. Snell.—p. 277.

Extraction Procedures for Determination of Vitamin B_6. Much of the vitamin B_6 present in natural materials is not available to microorganisms. Consequently, preliminary treatment of the sample is essential. In this study, such natural materials as dried yeasts, liver powders, fresh meats, and plant products were tested. Using a modification of an existing procedure for extracting pyridoxine, the materials were autoclaved with 0.055 N hydrochloric acid at a pressure of 20 lb. for 5 hr. With only one exception, maximal values were obtained. This method, which appears to release all of the vitamin in a form available to yeast, is superior to those now in use.

ANNALS OF SURGERY

Vol. 125, January, 1947

* Nutritional rehabilitation of surgical patients. J. H. Remington, J. A. Bargen, and J. deJ. Pemberton.—p. 115.

Nutritional Rehabilitation. Briefly reviewing the importance of the nutritional state in surgical cases, the authors discuss the value of such factors as proteins and vitamins. A case report is given of a patient who, because of severe nutritional deficiencies, might have been denied operation if the proper nourishment had not been given orally and intravenously. The importance of nitrogen balance in both pre-operative and post-operative care was stressed in lowering surgical mortality and morbidity.

BRITISH MEDICAL JOURNAL

No. 4502, April, 1947

Effects of diets on nitrogen loss in urine after burns. E. A. Sellers and C. H. Best.—p. 522.
Rations and nutritional needs. E. R. Bransby and H. E. Magee.—p. 525.

No. 4503, April 28, 1947

* Vitamin A in infective hepatitis. A. D. Harris and T. Moore.—p. 553.

Vitamin A in Infectious Hepatitis. It was found on examining thirty-two patients with infectious hepatitis that the vitamin A content of plasma was often very low. The age of the patient and the degree of pyrexia appeared to influence the extent of the fall in plasma vitamin A, but no correlation was found with the duration of anorexia. In absorption tests with massive doses of vitamin A, it was found that in the early stages of infectious hepatitis substantial amounts of vitamin A were excreted in the feces and sometimes in the urine. It appears that the mechanisms responsible for the absorption of vitamin A from the intestines, for its deposition in the liver, and for its release into the blood stream are not always affected to the same degree. The interpretation of the results of "absorption tests" as a measure of the degree of injury to the liver, therefore, seems uncertain.

DENTAL HEALTH

Spring, 1947

* The hard candy habit may dissolve tooth enamel.—p. 5.

Hard Candy and Teeth. Professors Samuel Charles Miller and Isaac Neuwirth of the College of Dentistry, New

York University, believe that citric acid used in the manufacture of most hard candy actually dissolves tooth enamel. Sucking hard candy keeps the teeth in a constant bath of dilute acid which, over a long period of time, may be strong enough to break down enamel. In addition, the high sugar content of hard candy, cough drops, candy wafers, and so on, sets up an activity of mouth bacteria and favors the growth of tooth decay. Examples are cited of two young women whose teeth developed large numbers of cavities after they had acquired the habit of sucking on hard peppermint candy for long periods of time.

FOOD RESEARCH

Vol. 12, March-April, 1947

* Rehydration of dehydrated meat. O. G. Hankins and H. B. Hetzer.—p. 111.

Pectinic acids as related to texture and quality of dehydrated fruit products. G. L. Baker and W. G. Murray.—p. 129.

* Evaluation of carotene content of fresh and cooked spinach. T. Porter, M. A. Wharton, and B. B. Bennett.—p. 133.

* Growth of *Staphylococcus aureus* in various pastry fillings. W. H. Cathcart, W. J. Godkin, and G. Barnett.—p. 142.

Effect of fertilizer treatment on total and reduced ascorbic acid content of potato tubers. J. M. Leichsenring, L. M. Norris, D. A. Grambow, and E. Donelson.—p. 151.

Rehydration of Dehydrated Meat. The palatability of dehydrated meat depends to a great extent upon its capacity to absorb and retain moisture. Because protein or fat content, size of particle, method of pretreatment, and temperature of drying affect the capacity of the finished product to absorb moisture, these factors were studied. A suitable method for determining the rehydration capacity of dehydrated meat was devised. High rehydration values were obtained when the vacuum-rotary or freezing cabinet method of processing was used. The drum-air flotation, kettle-air rotary, and kettle-cabinet methods gave relatively low values. Factors contributing to the high values obtained by the first-mentioned methods were high-protein and low-fat content, small size of particle, and relatively low processing temperatures.

Carotene Content of Spinach. Previous experiments have shown that certain vegetables, after cooking, contain more carotene per 100 gm. dry weight than the corresponding fresh vegetable. Because this has not been adequately explained, an experiment was made to determine the effects of various cooking processes upon the carotene content of spinach. When the fresh vegetable was cooked by a standard home procedure and calculated as milligrams per 100 gm. dry weight of the vegetable, carotene increased over 30 per cent. However, this was only an apparent gain, due to a difference in the solids of the fresh and cooked vegetable. A linear relationship was found between the carotene content of fresh and cooked spinach, making it possible to calculate a regression coefficient for either the moist or dry vegetable. As a result, the carotene concentration of the cooked product may be evaluated more accurately. When the regression for each type of processing has been established, a carotene determination will need only be done on the fresh product. Information on the cooked product can then be obtained by applying the regression coefficient.

***Staphylococcus Aureus* in Pastry Fillings.** Many food poisoning outbreaks, following the consumption of milk products, have been attributed to staphylococci. The authors investigated the growth of this bacteria in various products. Recipes for the various mixtures are given. Results showed that commercial dry-mixed puddings containing milk supported the growth of *Staphylococcus aureus*, as did vanilla, pumpkin, squash, and sweet potato pie fillings, cheese cake fillings, and whipping-cream mixes. Sufficient acidity was present in such fruit fillings as peach and raspberry to check the growth of the organism. Although the addition of citric acid to the vanilla filling checked growth of the bacteria, it imparted a sour taste. Lactic acid retarded the growth in cheese cake fillings and did not impart the sour taste associated with citric acid.

INDUSTRIAL AND ENGINEERING CHEMISTRY

Vol. 39, April, 1947

* Synthetic vitamins and human nutrition. R. R. Williams.—p. 464.

Synthetic Vitamins. Reviewing the history of vitamins, the author points out their scientific and philosophical implications. The role of vitamins as co-enzymes and as antivitamins is described. As it is believed that genes are enzymes, vitamins are also mentioned in relation to genetics.

A discussion of the usefulness of synthetic vitamins presents the subject of fortification of staple foods, such as bread and flour, corn, and rice. Emphasis is placed on the value of supplementing the food supply from the farm with that from the chemical factory.

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 133, April 12, 1947

* Peptic ulcer in the aged. E. D. Kiefer and D. McC. McKell, Jr.—p. 1055.

Vol. 133, April 19, 1947

* The management of jaundiced patients. A. M. Snell.—p. 1175.

* Intravenous therapy of cirrhosis of the liver. D. H. Labby, R. E. Shank, H. G. Kunkel, and C. L. Hoagland.—p. 1181.

Vol. 133, April 26, 1947

* The teaching of nutrition—I. Editorial.—p. 1281.

Vol. 134, May 3, 1947

* Synthetic folic acid. T. Spies, G. Lopez, F. Milanes, and T. Aramburu.—p. 18.

Teaching of nutrition—II. Editorial.—p. 23.

Peptic Ulcer in the Aged. It is generally believed that peptic ulcer is predominantly a disease of the young or middle aged. However, there is a type that presents itself in later life. A study was undertaken of 152 patients over sixty-five years of age, in whom a diagnosis of peptic ulcer was made. Aspects of nutrition which must be considered in prescribing a diet are included under the discussion of treatment. Because loss of teeth, lack of appetite, and possible faulty absorption of food decrease food intake, malnutrition is common in ulcer patients of advanced age. Emphasis is placed on the importance of a substantial protein ration. If a tendency to arteriosclerosis is observed, fat intake should be curtailed, and plain milk used instead of a milk and cream mixture. The carbohydrate content should be established by the rise and fall in weight, and the use of supplemental vitamins is advised in many cases.

Jaundiced Patients. Diagnosis, surgical indications, and treatment are all important phases in the management of cases of jaundice. Dietetic considerations, vital to adequate treatment of this liver disease, are included in this review. Patients with obstructive jaundice require highly individualized care. The daily diet should contain at least 350 gm. of carbohydrate, 150 gm. of protein, and fat as tolerated (most patients can take at least 100 gm. of fat a day). Vitamin supplements should be given as needed.

In cases of the primary hepatocellular forms of jaundice, management is directed toward maintenance of an optimal nutritional state. The diet should contain 350 to 500 gm. of carbohydrate, 100 to 150 gm. of protein, and 100 to 150 gm. of fat. Because many of these patients have no desire to eat, the problem of feeding them is often difficult. It may be necessary to measure the diet and chart caloric intake.

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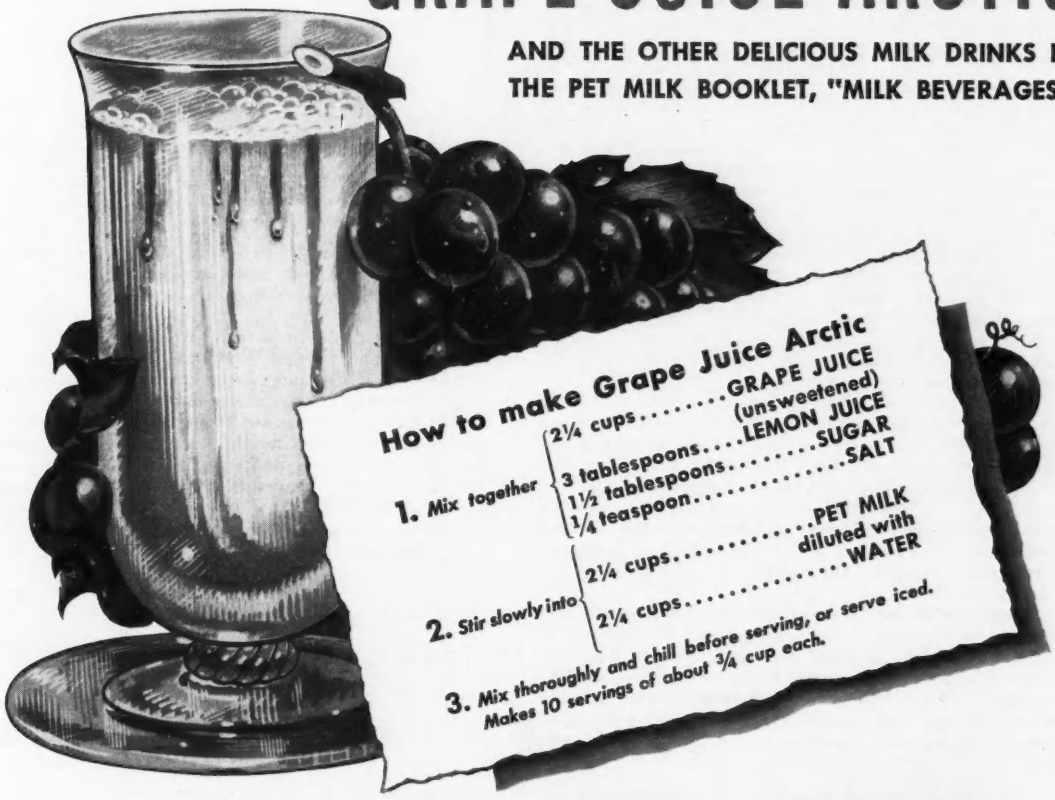
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It is the usual practice to supplement the diet with liberal quantities of vitamins.

Cirrhosis of the Liver. Studies have indicated that improper diet or specific nutritional deficiencies might be factors in the causation of the cirrhosis in human beings. Investigations have been made in an effort to evaluate the effects of treatment with a diet adequate in calories, protein, carbohydrate, and fat, combined with administration of large quantities of a crude, water-soluble liver extract given intravenously. Thirty patients with decompensated cirrhosis of the liver were observed. Therapy with the liver extract was given two or three times a week for six months or longer. Although no strict supervision of diet was undertaken, the patients were instructed to select foods high in protein and rich in carbohydrate; withdrawal from alcoholic beverages was required.

Early signs of improvement, eventually experienced by all patients, were a return of appetite and an increase in caloric intake. As a result, gain in weight and control of tissue wasting were observed. Twenty-three patients have survived two years or more. From these investigations it was concluded that crude liver extract restores and sustains appetite in anorexic patients. Used in conjunction with a full diet, the extract aids in the control of wasting and the restoration of protein storage.

Teaching of Nutrition. Nutrition should be given greater attention in the teaching of medicine. Physicians need to be taught to recognize borderline states of nutritive failure. Nutrition as a modifying factor in the course of such diseases as typhoid, peptic ulcer, and cirrhosis of the liver also needs emphasis. It is suggested that practical application of this science be integrated with the teaching conducted in clinical branches, for the curriculum is too full to establish a separate department devoted entirely to the study of nutrition.

Synthetic Folic Acid. The authors report the first cases of sprue, Addisonian pernicious anemia, and macrocytic nutritional anemia to whom synthetic pteroyldiglutamylglutamic acid has been administered. This substance is a conjugated form of folic acid which differs from the L. casei factor in having two more molecules of glutamic acid. It was effective in producing both a hematologic and clinical response.

THE JOURNAL OF BIOLOGICAL CHEMISTRY

Vol. 168, April, 1947

* Variations of the individual blood plasma amino acid nitrogen level. G. E. F. Brewer, W. S. Brown, C. C. Harvey, and M. K. Horwitt.—p. 145.
* The plasma amino acid and amino nitrogen concentration during normal pregnancy, labor, and early puerperium. R. W. Bonsnes.—p. 345.

Variations in Plasma Nitrogen. Fluctuations of the amino nitrogen contents of human blood plasma were observed. Over a period of about three months an average of 15.3 samples of fasting blood were taken from each of seventeen persons and the plasma amino nitrogen determined by the ninhydrin manometric method. The average nitrogen value of 262 determinations was 4.26 mg. per 100 cc. It was concluded that each individual develops his own average amino nitrogen level. The basal plasma nitrogen values of an individual do not seem to fluctuate greatly from day to day, but to develop upward or downward trends, which last for a limited number of days. The range of amino nitrogen in the plasma is an individual function that remains fairly constant from month to month.

Plasma Amino Acid and Nitrogen Concentration. Determinations were made of the alpha-amino acid nitrogen and the amino nitrogen in plasma during pregnancy, labor, and the puerperium. The plasma amino acid nitrogen averaged about 3.2 mg. per 100 cc. during pregnancy and labor. This was approximately 25 per cent less than values obtained on normal, non-pregnant women. The free amino acid nitrogen value returned to normal soon after delivery. The values obtained for amino nitrogen were generally higher than those obtained by the more specific alpha-amino acid nitrogen method. The reason for this is not clear. However, the results reported here necessitate a re-evaluation of the amino nitrogen levels in whole blood during pregnancy, as these values have previously been reported unchanged during pregnancy.

JOURNAL OF THE CANADIAN DIETETIC ASSOCIATION

Vol. 8, March, 1947

* High protein diets. L. G. Johnson, V. Schenker, and H. A. Sutherland.—p. 95.
* Home-made products versus commercially prepared mixes. V. O. Wilson and J. B. Brodie.—p. 102.
Wartime day nurseries and day care centres. E. Creed.—p. 114.

High-Protein Diets. The high-protein diets used in this study were found to be useful in cases of protein depletion. In addition to enumerating the main causes of protein deficiency and describing the various methods of feeding, the authors give examples illustrating the effects of high-protein, high-caloric diets. Emphasis was placed on the role of the dietitian in supervising, advising, and cooperating with the patient to assure adequate food intake.

Homemade Products and Prepared Mixes. In order that the Canadian housewife might have a shopping guide for buying commercially prepared foods, a study was undertaken to compare the quality, cost, and preparation time of prepared mixes with that of similar homemade products. Tests were made on tea biscuits; pastry; gingerbread; plain and chocolate cakes; doughnuts; pancakes; waffles; graham and corn muffins; and vanilla, chocolate, butterscotch, caramel, and tapioca puddings. The experimental procedure is described, the results are presented in tabular form, and the standard recipes used for preparing homemade products are given. In general, the homemade product cost less, was of higher quality, and required longer preparation time than the prepared mix.

JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

Vol. 16, November, 1946

* The present state of health in the Punjab. M. Yacob and S. Swarosp.—p. 47.

State of Health in the Punjab. An account of health conditions in the Punjab is given in this article. Eye diseases, diseases of the digestive tract, and malaria are responsible for 50 per cent of the cases in the hospitals and dispensaries of the province. The infant mortality rate is very high, but more babies are born than in some of the western countries. Because of the number of babies born, child bearing is very difficult for these women. The condition is further aggravated by the low nutritional status of the mothers. In spite of the low standards of health and hygiene, the population is increasing. If this rate of growth continues and health is improved, will there be enough food for all?

THE JOURNAL OF NERVOUS AND MENTAL DISEASE

Vol. 105, April, 1947

* The effect of oral administration of lactic acid upon the clinical course of depressive states. H. Lowenbach and M. H. Greenhill.—p. 343.

The Effect of Lactic Acid. It has been maintained that recovery from mental disorders is dependent upon the occurrence of generalized convulsions. Investigation was made of the possibility that some of the products resulting

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from violent muscular activity during an induced seizure might play a role in the recovery from mental disease. It is known that generalized convulsion increases the lactic acid content of the blood for a short period of time. Experiments showed that a combination of 25 cc. of lactic acid U.S.P. and 25 cc. of sodium lactate (60 per cent) dissolved in 300 cc. of milk permitted the highest concentration of lactate ion which can be tolerated by a patient in one dose. Results obtained on over 100 patients indicated that administration of this mixture influenced the mood of patients in depressive states. The role of carbohydrate metabolism associated with depressive states bears further investigation.

THE JOURNAL OF NUTRITION

Vol. 33, April 10, 1947

* The effect of methionine upon the urinary nitrogen in men at normal and low levels of protein intake. R. M. Johnson, H. J Deuel, Jr., M. G. Morehouse, and J. W. Mehl.—p. 371.
* Some observations on the nutritional value of dialyzed whey solids. F. K. Daniel and E. H. Harvey.—p. 429.
* Nitrogen retention studies on rats, dogs, and man; the effect of adding methionine to an enzymic casein hydrolysate. W. M. Cox, Jr., A. J. Mueller, R. Elman, A. A. Albanese, K. S. Kemmerer, R. W. Barton, and L. E. Holt, Jr.—p. 437.
* Tissue reserves of ascorbic acid in normal adults on three levels of intake. J. E. Haines, A. M. Klosterman, H. M. Hauck, M. A. Delaney, and A. B. Kline.—p. 479.

The Effect of Methionine on the Urinary Nitrogen in Man. The nitrogen-sparing effect of methionine, which has been shown in animal studies, would be of considerable importance in human nutrition under conditions of restricted food and water intake. By including a relatively small amount of a single amino acid in a restricted diet, body protein would be conserved and less water would be required for the excretion of urea and other solutes. Experiments were carried out on human subjects during ten-day periods to test the effects of added methionine on urinary excretion. Diets supplying 2000 calories and 75 gm. of protein; 2000 calories and 14 gm. of protein; 1200 calories and 5 gm. of protein; and 600 calories and 5 gm. of protein were employed. In no instance did the addition of 3 gm. of dl-methionine per day to the low-protein diets decrease the urinary nitrogen excretion. Under the conditions employed, methionine alone did not spare body protein, nor was its sulphur utilized. The study demonstrated the importance of an adequate caloric intake when minimal nitrogen excretion is to be attained on a low-protein diet.

Nutritional Value of Dialyzed Whey. Lactalbumin is a far more efficient source of dietary nitrogen than casein. As human milk is much higher in lactalbumin than cow's milk, it would seem that an infant food having a lactalbumin/casein ratio similar to that found in human milk should be more nutritious. By partial substitution of whey for milk proteins, such a formula was devised. However, rats fed on the normal milk diet gained more than the rats on a high lactalbumin diet. This investigation was made to clear up the apparent discrepancy. Removal of a considerable portion of minerals from whey by means of dialysis resulted in a more favorable growth response. If these minerals were reintroduced to the dialyzed whey after ashing, the rats' growth again was impaired. This proved that one or more of the inorganic constituents, rather than an organic compound, affected detrimentally the nutritional value of whey. On a diet in which 53 per cent of the casein was replaced by dialyzed whey lactalbumin, rats showed 14.5 per cent greater efficiency in conversion of food to body tissue than rats fed on a corresponding formula containing milk proteins only.

Methionine Requirement and Species. Although animal studies have indicated that the nutritive value of casein can be improved by addition of cystine or methionine, results have not been confirmed in human beings. Experiments on dogs, rats, and man have shown a striking species difference. The addition of cystine or methionine to a casein hydrolysate given as the sole source of nitrogenous food increased the rate of growth in rats and the magnitude of nitrogen retention in dogs. There was no effect on the nitrogen retention in four groups of human subjects. The explanation for this difference is based on the fact that the rat and dog are covered with hair and man is not. Hair contains large amounts of cystine; therefore, the requirement of animals for this amino acid is greater than that of man. This investigation serves to illustrate that results with one species cannot always be applied to other species.

Tissue Reserves of Ascorbic Acid. This study was concerned with a comparison of tissue stores of ascorbic acid associated with three levels of intake, which were maintained for a period of six weeks. Twelve normal adults served as subjects. The state of tissue reserves was judged by the fasting plasma ascorbic acid values. Depletion of tissue stores was slight on the 70 mg. allowance, moderate on the allowance of 50 to 53 mg., and fairly marked on the 33-mg. intake. These experiments provided no evidence of the value of tissue reserves of ascorbic acid.

THE LANCET

Vol. 1, April 19, 1947

* Recovery from starvation. R. O. Murray.—p. 507.
* Folic acid in the treatment of the sprue syndrome. L. S. P. Davidson, R. H. Girdwood, and E. M. Innes.—p. 511.

Vol. 1, April 26, 1947

* New concepts of hospital feeding. J. A. F. Stevenson and E. H. Bensley.—p. 568.

Recovery from Starvation. The convalescent from starvation, whose gastrointestinal tract has begun to recover its function as often shown by the cessation of diarrhea, and who is not confined to bed, displays a great desire for food. The use of a high-caloric diet to satisfy this appetite seems to be justified. A study was made of 930 men who had been liberated from German concentration camps and had received initial hospital treatment for two or three weeks. The average degree of wasting was estimated to be about 23 per cent of the original body weight. More than 95 per cent of the patients gained weight quickly and advanced rapidly toward the full recovery of health on rich diets of between 7500 to 8000 calories daily. It is considered that the optimum constitution of such a diet should be 224 gm. fat, 275 gm. protein, and 1000 gm. carbohydrate. The results suggest that the greatest benefit from such a diet arose in the first week and was in proportion to the amount of starvation.

Folic Acid in the Treatment of Sprue. Folic acid was given to patients with the sprue syndrome. In nine out of ten cases the hematological response was considered unsatisfactory in that this treatment either produced no significant rise in the red cell count or failed to restore the blood level and hematological picture to normal. Diarrhea was controlled and clinical improvement resulted in the seven adults suffering from tropical sprue or idiopathic steatorrhea. Folic acid did not improve fat absorption in five out of six cases of the sprue syndrome.

New Concepts of Hospital Feeding. Recent investigations of metabolism following injury and in disease have shown that weight loss is due to malnutrition which may interfere with recovery. During the late war the Canadian army overseas undertook a nutritional program to overcome this problem. The program, which is outlined in this article, can be applied to civilian hospitals. Descriptions of the results of surveys of food intakes of patients, the measures used to attain the required standards, and the catering program are included.

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THE NEW ENGLAND JOURNAL OF MEDICINE

Vol. 236, April 3, 1947

* Medical progress: Effects of protein deficiency on the pregnant woman, fetus, and on the infant and child. (to be concluded) H. C. Stuart.—p. 507.

Vol. 236, April 10, 1947

* Medical progress: Effects of protein deficiency on the pregnant woman, fetus, and on the infant and child. (concluded) H. C. Stuart.—p. 537.

Effects of Protein Deficiency. This is a review of the recent work on the role of proteins in pregnancy, and their relationship to the fetus, infant, and child. The general outline that emerges reveals that poor growth and development, particularly faulty muscle development and general lack of physical fitness, are frequent consequences of chronic low-caloric, low-protein nutrition in childhood.

NUTRITION REVIEWS

Vol. 5, April, 1947

* Nutrition and tuberculosis. H. R. Getz.—p. 97.
* Present knowledge of vitamin B_6 in nutrition.—p.98.
Choline requirements and toxicity.—p. 116.

Nutrition and Tuberculosis. Although the relationship of nutrition to tuberculosis has been accepted largely on an empirical basis, history reveals that food, in one form or another, has been an important factor in the treatment of the disease for many years. The earliest medical writings tell us that Greek physicians advised human milk, and the fisher folk of northern Europe used cod-liver oil. Earlier in this century overfeeding was practiced, but today bed rest and adequate dietary intake, as recommended for any healthy person, is the basis of treatment. Since the appetite of a patient on bed rest is often poor, every effort must be made to maintain adequate food intake. Tests show that tuberculous patients may be deficient in ascorbic acid, vitamin A, protein, iron, and in the advanced stage, calcium. The significance of these observations is not clearly understood. However, since these deficiencies have been found, the diet should be planned to overcome them.

Vitamin B_6 in Nutrition. The term "vitamin B_6" refers to a group of at least three related compounds—pyridoxine, pyridoxamine, and pyridoxal. These compounds are equally active when administered apart from other foods, but pyridoxal and pyridoxamine are less active than pyridoxine when the three are mixed with a ration. Methods of determining the vitamin include chemical procedures, biological assay with rats, and microbiological procedures. A study of metabolic functions has revealed that impaired growth and development of anemia are among the results obtained when animals are fed a diet deficient in vitamin B_6. Although pyridoxine has been used in treatment of patients showing symptoms similar to those observed in animals, few positive results have been reported. The usefulness of this vitamin in medical practice has not yet been determined.

THE PSYCHOANALYTIC REVIEW

Vol. 34, April, 1947

* Psychosomatic aspects of obesity. A. Schick.—p. 173.

Aspects of Obesity. Food and eating play the leading roles in the process of becoming stout. The increased appetite has been explained by many theories. In endocrine and cerebral disease an inefficiency in the metabolism regulating apparatus may be responsible for an abnormal desire for food. Heredity may also play a part. Cases of "simple obesity" as distinguished from those in which there is evidence of somatic lesions may express certain emotional forces. Conflicts within a person may find an expression in food and lead to obesity. "Obesity must be considered a significant symptom of the total personality 'looking upon our body as an image which is built up in ourselves in accordance with our instinctive attitudes.'" A case is presented to illustrate the observation that "unconscious emotional tension, long dammed up, may influence the vegetative hormonal system and produce secondary somatic symptoms."

REVISTA DE NUTRICION

(Peru)

Vol. 1, July, 1946

* Scarcity of animal protein in Peru. J. A. Bedoya H.—p. 1.
* The nutritive value and price of foods. J. A. Bedoya H —p. 65.
* A study of the bacteria and nutritive content of some ice creams consumed in Lima in the summer of 1945. J. A. Bedoya H.—p. 870.

Scarcity of Animal Protein. The author stresses the importance of proteins in human nutrition and the high biological value of animal proteins. From studies which were conducted in Lima in 1940, the worker found that the population was consuming a diet low in protein, particularly animal protein. The diet in some of the interior sections was also inadequate in animal protein. He suggests that by increasing the production of soy beans and yeast and by educating the public in ways of using these products, the protein level may be increased. It is also suggested that the government encourage the development of the fishing industry; however, because of lack of refrigeration in all areas, except Lima, the fish to be utilized must be salted or made into an acceptable type of fish flour. A standard has been established called the "Ideal Peruvian Individual." That individual should receive an average of 41.6 gm. of animal protein daily, consisting of 400 gm. milk, 125 gm. meat, and ½ egg. There should be studies made of means to increase the production of cattle and poultry.

The Nutritive Value and Price of Foods. Methods of studying the nutritive value of foods in relation to the price of foods were discussed. The cent-calorie method and a "caloric standard" method based upon the price of a 3000-calorie diet were methods which the statistician could use to estimate the changing food costs and the dietitian could use in planning low-cost dietaries. Two others which would compare the cost of an adequate diet to the prevalent wage scale were discussed. By these methods it was determined that the food cost has risen about 78 per cent in the last four years while the Peruvian wage increase has been about 25 per cent.

Bacteria and Nutritive Content of Some Ice Creams. Ice creams from three plants were analyzed. The protein content ranged from 2.5–5 per cent. The products sold at the same price. The bacteria content showed wide variation, demonstrating that there was deficient pasteurization and poor sanitary control. It is recommended that there be protective legislation to insure a product of uniformity and one which meets the standards of sanitation.

SCIENCE

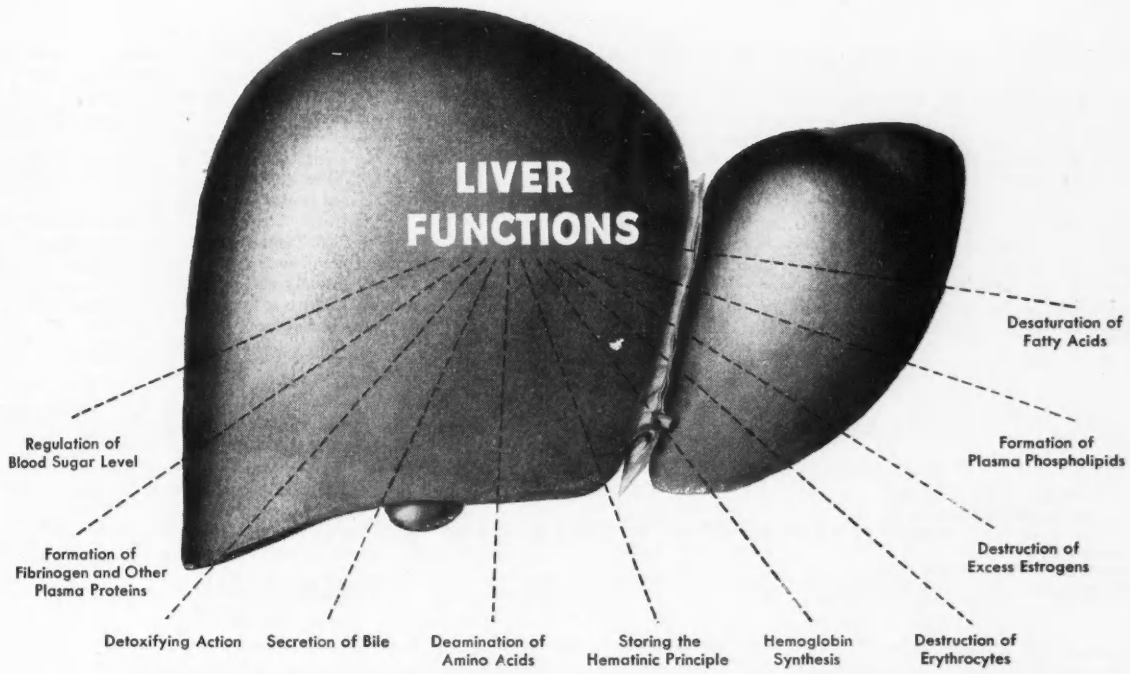
Vol. 105, April 18, 1947

* A chemist's view of nutrition L. A. Maynard.—p. 399.

Vol. 105, May 9, 1947

* Hereditary obesity and efficient food utilization in mice. G. E. Dickerson and J. W. Gowen.—p. 496.

A Chemist's View of Nutrition. Chemists are continually making new discoveries which re-emphasize the importance of nutrition and aid in the proper application of our knowledge. Although advancement has been made, many



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The complex nature of the manifold functions of the liver is reflected in the diagram shown above. To maintain its functions in an efficient manner, the liver must be adequately protected against toxic influences. Parenchymatous damage with ensuing decreased functional capacity can lead to severe metabolic derangements.

Protein deficiency is an important factor in precipitating impaired liver function. On the other hand, an adequate intake of biologically complete protein, ordinarily in the form of protein foods, is indispensable as a safeguard of liver competency.

Among man's protein foods, meat ranks high not only because of its generous content of protein, but also because its protein is biologically complete, capable of satisfying all protein requirements. Furthermore, all meat is 96 to 98 per cent digestible.

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problems are as yet unsolved. Knowledge of nutrition, which involves both body needs and food supplies, is by no means complete. We need a better understanding of the biochemistry of body processes and of the quantitative and qualitative requirements of the body for dietary essentials, such as amino acids and vitamins. We also need quantitative data on the food supply—its availability and its utilization. The effect of soil deficiencies, the effect of climate, and the effect of processing and storage on the nutritive value of foods need study. Consideration should also be given to economic aspects. Because the entire biological cycle is involved in nutrition research, the cooperation of scientists having varied interests and training is essential, and the chemist must be one of the chief contributors to this program. Specific phases of nutrition research which should be developed further are pointed out in this article.

Hereditary Obesity in Mice. Because a marked adiposity can be induced in mice by the "yellow" gene, it was possible to undertake a controlled experiment to observe inherited fatness in relation to the efficiency of food utilization. The sixty-two yellow and sixty-five black littermates used in the study differed presumably only in the one chromosome which carried the "yellow" gene. Results made it apparent that the "yellow" gene increased fat deposition and lowered the food requirement per unit of gain by increasing the appetite slightly and reducing the energy expended in body work. More efficient food utilization was the cause of hereditary obesity.

AMERICAN RESTAURANT

Vol. 31, March, 1947

* Flying food. R. Wade.—p. 52.
Two-line basement cafeteria—p. 67.
How to buy, store and cook poultry. J. A. Cline.—p. 82.
* Restaurant inventory program. S G. Putnam.—p. 140.
Selecting a restaurant location.—p. 150.
** Refrigeration "tricks" speed service.—p. 154.

Vol. 31, April, 1947

All about lamb. J. A. Cline.—p. 34.
* Value of job evaluation. L. W. Thatcher.—p. 39.
The Firestone cafeteria.—p. 122.

Flying Food. The Airport Restaurant in Kansas City, Missouri, has become a model for airport restaurants. In addition, the Airline Food Service Department, which assumes 40 per cent of the restaurant's total volume of business, operates virtually as a completely separate industry. Approximately 30,000 meals and 18,000 to 20,000 snacks per month are placed on the scheduled airlines, plus a vast array of meals specially prepared for charter flights. All preparation of food to be placed aboard planes is planned on the strictest sort of schedule. For some airlines the restaurant plans the menus, and for others, meals are prepared to conform with a menu worked out by the line. Each menu used through Kansas City is changed at the end of four days. Meals themselves are complete and are composed only of the finest foods. In both preparation and packing the most intensive care is given to every item, and "eye-appeal" is emphasized.

Inventory Program. Proper control over the restaurant inventory calls for knowing the quantity and amount of each item sold each day. At the S & W Cafeteria in Washington, D.C., a meeting is held each morning with the dietitians, junior assistant managers, and each department head, to go over the previous day's operation, the next day's menu, and production figures based on anticipated sales. Other procedures which are used in this cafeteria to make the inventory program successful are mentioned in this article.

Refrigeration "Tricks" Speed Service. A series of simple changes in ordinary restaurant refrigeration practices are enabling one new restaurant to serve 135 customers per hour. The major timesaver is a metal ice bin, which is used for keeping salads cold. Salads, all made up at the salad bar one hour before the peak meal period, are immediately placed on a bed of cracked ice in the bin where waitresses may pick them up quickly. After the ice bin is stocked, the salad bar is used for making sandwiches to order. As soon as the ice bin is emptied, the portable unit is wheeled into the walk-in freezer box which keeps ice meltage at a minimum, until it is required again for the evening meal.

Job Evaluation. A program of job evaluation can make personnel work more effective. The first step in such a program is a job analysis to obtain complete knowledge of the duties and responsibilities of each position in the business. There should also be a carefully established method of determining, in money, the relationships between jobs. The benefits of job evaluation are pointed out.

BETTER FOOD

Vol. 52, March, 1947

* Food facts.—p. 6.
* Oysters—their place in group feeding. L. Radcliffe.—p. 18.
* Lobsters on the airways. E. Doucette.—p. 22.
How to teach calcium and iron. H. H. Darby.—p. 25.
Cod—the beef of the sea. R. G. Kerr.—p. 30.
Why a refrigerator? H. H. Darby —p. 40.
* Two million meals a day. H. Yeoman—p. 46.
* The school lunch goes mining.—p. 54.

Vol. 52, April, 1947

Guava in powder form.—p. 7.
s there really a need for breakfast? A. G. Reasor.—p. 34.
* The veterans learn to cook. M. Gray.—p. 38.
Springtime and the school lunch.—p. 52.
The restaurant and breakfast.—p. 56.
* Egg keeping qualities.—p. 62.
* Dry milk supply increasing.—p. 63.

Food Facts. Sobolt lettuce produces leaves which are usable three weeks longer than other varieties. This seed is now obtainable from most seed houses. . . . Dehydrofreezing, a new type food preservation, combines both dehydration and freezing. The costs of transportation, storage, packaging, and refrigeration will be lowered by dehydrofreezing. . . . A chemical fungi-killing wash is now being used for vegetables, which are packaged in transparent wrappers and held in refrigeration until ready for use. Even after thirty days, the produce appears field-fresh.

Oysters. As of January 1, 1947, there are five established grades of oysters. This grading facilitates determination of the number of servings per gallon and the cost per serving. Due to quick freezing, oysters can now be obtained the year round.

Lobsters on the Air Ways. Maine lobsters are now packed in ice and shipped by air to all parts of the country. Lobster is a highly perishable product to ship, but air transport promises to overcome this difficulty. According to Maine law, only lobsters that measure from $3\frac{1}{4}$ to 5 in. from the eye socket to the end of the body shell can be caught.

Two Million Meals a Day. Britain's School Meals Service aims to feed 75 per cent of the children a nourishing, hot mid-day meal. Now 43 per cent of the school popula-

IN THE AIM TOWARD EARLIER POSTOPERATIVE RECOVERY

The advantages of early postoperative ambulation have become well established. More rapid return of strength, reduced incidence of embolic phenomena, and decreased morbidity are but some of the benefits obtained. Early ambulation, however, presupposes early postoperative satisfaction of nutritional requirements to prevent undue fatigue and to encourage optimal wound healing.

As a means of enhancing the nutritional state during the postoperative period, the food drink made by mixing Ovaltine with milk finds wide applicability. Readily digested and of low curd tension, it may be given as soon as liquids can be tolerated. Its generous supply of essential nutrients goes far in satisfying the increased needs of the early postoperative period. This delicious dietary supplement provides biologically complete protein, readily utilized carbohydrate, easily emulsified fat, B-complex and other vitamins including ascorbic acid, and essential minerals.

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PROTEIN	32.1 Gm.	VITAMIN B_1	1.16 mg.
FAT	31.5 Gm.	RIBOFLAVIN	2.00 mg.
CARBOHYDRATE	64.8 Gm.	NIACIN	6.8 mg.
CALCIUM	1.12 Gm.	VITAMIN C	30.0 mg.
PHOSPHORUS	0.94 Gm.	VITAMIN D	417 I.U.
IRON	12.0 mg.	COPPER	0.50 mg.

*Based on average reported values for milk.

tion are receiving these hot meals. The government hopes to provide one third of the daily needed 2500 calories. The price of these meals ranges from 5 to 9 cents. The lunch consists of 1 oz. cooked meat, two vegetables, and dessert, followed by cheese cubes. Service is cafeteria style.

School Lunch. An important function of the school lunch program is to ferret out the minerals in foods and to distribute them wisely in the menus. Menus and recipes that will increase calcium and phosphorus intake are given.

Guava in Powder Form. Scientists at the Hawaii Experiment Station have recently developed a powder from dehydrated guava juice which is rich in pectin, ascorbic acid, and fruit flavor. Largely pectin, the new powder retains the fine aroma and flavor of the fresh fruit and 60 per cent of its ascorbic acid. It can be economically and conveniently shipped.

Veterans Learn to Cook. A change in attitude, the small number of immigrants, and an opportunity for excellent jobs have drawn more and more veterans and high school boys into food trade schools where they have an opportunity to become chefs and bakers. The Food Trades Vocational High School in New York City is unique in that it is the only public high school offering exclusively food trades courses. While the high school students combine academic subjects with the food trades, the veterans study only the latter. Veterans may take only one course at a time. There is full cooperation between the unions and industry in the furtherance of this venture. Teacher qualifications are also high. A veteran may come from any place in the country, but must apply in person, so that the faculty may make sure of his or her genuine interest.

Dry Milk Supply. During the past ten years the production of dry milk has tripled. The record high of 863 million lb. came in 1945; the war is held responsible for the great increase. Lower military demand now means a larger supply for food trades and the housewife. The largest civilian user of this product is the baking industry, with fairly large amounts also used by hotels and restaurants.

CONSUMERS' GUIDE

Vol. 13, April, 1947

* What? why? how?—p. 3.
When you choose cheese.—p. 5.
A few well chosen herbs.—p. 13.
* Dry milk tried in school lunches.—p. 15.

Market Research Program for Agricultural Products. The Research and Marketing Act of 1946, passed by Congress last summer, authorizes agricultural research at all stages of the marketing process and backs the research with appropriations starting at $9½ million in 1947 and reaching $61 million in 1951. This Act will aid consumers by improving standards of quality. The Secretary of Agriculture is directed to aid and cooperate with consumer research for fuller utilization and consumption of agricultural products. Consumers will also be affected by research aimed at reducing handling charges. This will lower prices and increase producers' returns. The Act provides for an eleven-man National Advisory Committee and for specific commodity groups to provide broader representation of the many people with a keen interest in agricultural research.

Dry Milk Tried in School Lunches. In the National School Lunch Program, dried milk has been distributed to schools for use as a beverage in areas where fresh fluid milk is unobtainable. The acceptability of the reconstituted milk beverage varied from 56 per cent to 100 per cent, with the majority of schools reporting over 80 per cent. Teacher acceptance and nutrition education greatly increased pupil acceptance of this product, as did the addition of flavorings in certain cases.

HOSPITAL MANAGEMENT

Vol. 63, April, 1947

* If your hospital food service is buying a refrigerator.—p. 84.

Buying a Refrigerator. There are many aspects to be considered in selecting a new refrigerator for hospital food service. Features of construction that should be given attention are mentioned in this article.

HOSPITALS

Vol. 21, April, 1947

* Six time studies in transporting food to patients. G. M. Hepple.—p. 71.
Central tray service. Comment.—p. 73.

Vol. 21, May, 1947

* On launching a department of personnel relations. R. F. Hosford.—p. 45.
* Better food service for small hospitals through dietetics conferences.—p. 48.
* Infant formulas no. I—study of methods now used. A. J. J. Rourke.—p. 67.
* Hospital dietetics in Central and South America. Comment.—p. 70.

Transporting Food to Patients. Methods of transporting patients' meals from kitchen to bedside and the time elements involved have been studied. The types of service considered were those in which (a) trays were prepared in a central kitchen and sent to various floors by dumbwaiters, tray carts via elevators, or vertical tray conveyers, and (b) food was prepared in a central kitchen and sent in bulk on food carts to service pantries where trays were prepared. Time studies for each type of service are charted and each method is discussed.

Central Tray Service. Trends in planning hospital food service units, as discussed at the Institute on Design, Construction, and New Equipment for Food Service in Hospitals, held in Chicago in December, are presented. A layout for a central service unit is shown.

Department of Personnel Relations. We are becoming more aware of the need for a more intelligent and effective employer-employee relationship program. In addition to a description of such a program, this article includes two diagrams, one portraying suggested employment procedure and the other uniquely presenting effective grievance procedure.

Dietetic Conferences for Small Hospitals. A training program directed toward better food service for patients in smaller hospitals is being tested in Illinois by the American Hospital Association. Nine one-day conferences were held throughout the state during May and June. Those individuals who have charge of food service in hospitals not employing dietitians were brought together to discuss problems and meet with outstanding people experienced in food service. The project offers state hospital and state dietetic associations an excellent opportunity to be of service to the small hospitals.

Infant Formulas. The potential hazards of the formula room in maintaining good nursery technique are impressive. Formula preparation technique from the bacteriological point of view was surveyed at five California hospitals. Terminal sterilization and various aseptic techniques were the methods evaluated. Tests indicated that the so-called aseptic technique is unsatisfactory. Clean preparation, complete assembly of unit, and terminal sterilization resulted in a more nearly sterile formula. Procedures used in terminal sterilization are described.

Dietetics in Central and South America. While in Guatemala, Frances MacKinnon, nutrition consultant with the Inter-American Unit of the Children's Bureau and past president of the American Dietetic Association, has observed the problems which confront a dietitian in Central America. Food supplies and customs vary with each country, and cooking procedures are modified by such factors as altitude, kind and quantity of food, and equip-

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ment. The daily menu for a large hospital follows a pattern quite different from that found in the U. S. Food purchasing is made difficult by lack of grading or packing. Proper equipment is often unobtainable. As there are few trained dietitians in Latin America, hospital dietetics presents an interesting challenge in these countries.

THE MODERN HOSPITAL

Vol. 68, April, 1947

* The dietitian as a buyer. M. C. Bernard.—p. 100.
* Nutritional requirements of children. B. M. Smyers.—p. 102.

The Dietitian as Buyer. The dietitian is responsible either directly or indirectly for spending a large portion of the hospital dollar. To be efficient in the capacity of buyer, she must give sufficient time and thought to her purchasing problems; she must be given the necessary clerical assistance; and she should have the necessary technical information. Suggestions are given which will help the dietitian improve her ability as a buyer.

Nutritional Requirements of Children. This brief review of the nutritional requirements of children suggests the dietary needs of the infant. Eating habits are briefly discussed, and the daily basic diet to be followed during the second year is listed.

PERSONNEL JOURNAL

Vol. 25, March, 1947

* Are you "encouraged"? B. Sless.—p. 299.
Principles in manpower utilization. L. L. McQuitty.—p. 302.
* Supervisory training methods. P. B. Lewis.—p. 316.

Are You "Encouraged"? If supervision were accomplished by encouragement, many of the present-day labor difficulties would disappear. Encourage the employees to discuss their work with you. Although they may complain at first, eventually they will offer helpful suggestions. If employees can be encouraged to think constructively, fewer criticisms of management will develop.

Supervisory Training Methods. The aim of today's industry is high production of the best quality products at the lowest practical operating cost. Improved training and personnel practices will help to accomplish this. The basic teaching methods are: information-giving, instruction, and discussion or conference procedure. Training gives a systematic approach to the jobs so that employees accomplish their work safely, correctly, efficiently, and with high morale. Training by example is the basis of supervisory training efforts. Coaching on the job represents a major part of the training effort. Training through department meetings, plant-wide discussion programs, informative meetings, and special programs should all contribute to management and employee team work.

PRACTICAL HOME ECONOMICS

Vol. 25, March, 1947

Pennsylvania Dutch cookery. L. H. Wallace.—p. 160.
* Professional women's diets. B. E. Fussell.—p. 161.

Vol. 25, April, 1947

Southern colonial cooker. L. H. Wallace.—p. 228.
* For lunch rooms and food centers.—p. 229.

Professional Women's Diets. A survey was made of the diets of a few professional women who live alone, doing their own marketing, planning, and cooking. Dietary habits were observed for a period of one week. Of twenty-one women, only one met all of her daily dietary requirements. Although the others ate fairly adequate diets, it was evident that nutrition education should be encouraged among professional women. These women should also be encouraged to use time-saving equipment and products for food preparation. As a result of good food habits in this group, greater numbers of the population will ultimately be reached.

For Lunch Rooms and Food Centers. Several pages are devoted to pictures and descriptions of school lunch and food laboratory equipment. Refrigerators, stoves, dishwashers, and various pieces of smaller equipment are included.

RESTAURANT MANAGEMENT

Vol. 60, April, 1947

* It's later than you think. J. W. Stokes.—p. 31.
How proper maintenance prolongs the life of your floors. D. E. Smalley.—p. 34.
* Setting up a safety program. K. W. Francis.—p. 37.
The niceties of quantity preparation and service. A. Easton.—p. 42.
* Basic principles of layout for quantity service kitchens. A. W. Dana.—p. 44.

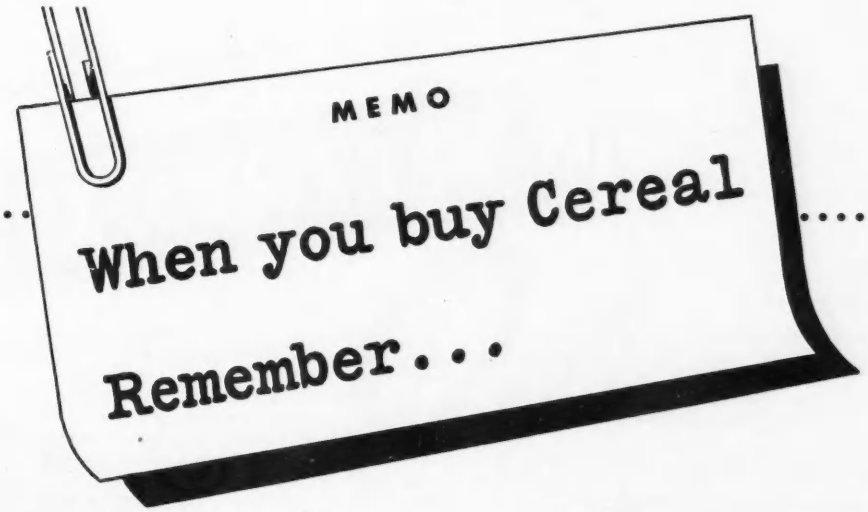
It's Later Than You Think. The return of high standards in hotels and restaurants will be retarded until top management realizes that good public relations can be established and maintained only through good employee relations. The problems of courtesy and sanitation are a question of inner motivation and attitude of the individual employee. Higher standards of sanitation, service, and courtesy may be obtained by careful selection of employees, by proper training in human relations as well as operating techniques, and by giving the workers a sense of responsibility for the success of the establishment in which they are employed. Various methods by which the employees' attitudes can be influenced are discussed.

Setting Up a Safety Program. The restaurant accident problem is a serious one and results in wasting thousands of dollars in damaged and broken materials, causing injury to both staff and patrons and even an occasional death. The opportunities for constructive work in accident prevention by engineering, education, and persuasion are almost limitless. There is a need for further information on standard records and reporting systems for restaurants. The basic causes of the accidents are so alike that the most important problem in their prevention is the controlling of human behavior. A classification of accidents is given, and suggestions are made for a restaurant accident prevention program.

Principles of Layout for Kitchens. Factors to consider in planning or expanding a restaurant are pointed out. A chart shows a suggested formula for estimating the seating capacity and area needed in proper relationship to rent, investment, and sales; and for allocating the remaining areas properly to the kitchen, storage, and other facilities.

Refrigeration of Peanuts

The shelf life of peanuts and peanut products is lengthened from five to ten times when stored at 36°F., as compared to storage at room temperature, according to Dr. J. G. Woodroof, Georgia Agricultural Experiment Station. Refrigeration, when properly used, will also prevent oil separation in peanut butter and prevent insect infestation.—*Food Field Reporter, February 17, 1947.*



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News Notes

Food and Nutrition Board Meeting. The Food and Nutrition Board of the National Research Council held its thirtieth meeting in Washington, May 9 and 10. The Board now has sixteen standing committees and two joint committees with the Agricultural Board.

Dr. W. R. Aykroyd, Director, Nutrition Division, FAO, outlined the plans and problems with which his office is currently concerned in developing international nutrition programs. The food and nutrition problems of the Army were discussed by George Gelman of the Quartermaster Food and Container Institute and by representatives of the Surgeon General's Medical Nutrition Laboratory.

The Board was specifically requested to act on standardization of nutrition survey methods so that reported data would be on a comparable basis. It was especially urged that those doing nutrition surveys report actual food items consumed rather than a calculated nutrient analysis so that confusion of conversion factors could be avoided.

Discussion of Navy problems showed that the Navy needs all possible advice on the development of submarine rations with acceptable foods that will provide ample nutrients within limited storage space. Anticipated submergence may be for as long as ninety days, and the psychological as well as the physiological hazards of malnutrition may be greatly amplified.

International problems with food allocation were discussed by Dr. John M. Cassels of the Department of Commerce, assisted by H. W. Peter, Department of State. The suggestion was made that all documents which have been prepared by the Board and other agencies relative to emergency food requirements be assembled in one volume. Mr. Peter presented for technical review a report on "Tentative Calorie Reference Levels for Use with the Benchmark Levels of the National Research Council." Tentative calorie levels from which food requirements can be estimated are suggested for thirty-five countries. Three questions pertaining to an appropriate body weight index for representing the energy requirements of a population were submitted to the Board for an expression of opinion.

Harry C. Trelogan and Philip Talbott of the Production and Marketing Administration of the Department of Agriculture discussed problems facing the milk and baking industries. Marjorie Heseltine reported for the Children's Bureau, and Grace Bulman and Jean Crooks for the Veterans Administration.

During the second phase of the meetings, committee reports were given and discussed.

Dr. R. R. Williams introduced a resolution prepared by the Committee on Cereals favoring legislation for the enrichment of corn meal. A pamphlet prepared by this committee entitled *Bread and Flour Enrichment 1946–47* was published in February. Since that time Kansas and Oklahoma have passed enrichment legislation.

Dr. W. E. Krauss reported for the Committee on Milk which have been concerned with expanding the use of nonfat milk solids for human food in areas where fluid milk is scarce. The School Lunch Program in some states offers an excellent opportunity in this respect. The committee was upheld by the Board in not favoring at this time the fortification of milk with vitamin A or enrichment of cheese with certain B vitamins.

Dr. L. A. Maynard reported on action taken by the FAO Committee on Calorie Conversion Factors and Food Composition Tables. The principles elaborated by this committee in an attempt to standardize international practices were referred to the Committee on Food Composition for determination of their applicability in the U. S.

Dr. H. D. Kruse reported for the Committee on Diagnosis and Pathology of Nutritional Deficiencies. Dr. Norman Jolliffe is directing a Subcommittee on Preparation of a Handbook on Clinical Diagnosis of Nutritional Deficiency States with the cooperation of Dr. Paul Cannon, representing the American Medical Association, and Dr. F. F. Tisdall, representing the Canadian Medical Association. Dr. Walter Wilkins is directing a Subcommittee on a Nutrition Program for State Health Departments.

Dr. P. C. Jeans reported for the Committee on Dental Health which is making a comprehensive review of literature on dental caries. Three sections entitled "Dental Caries in Rats," "Fluorine and Dental Caries," and "Oral Environment and Dental Caries" have been completed. The fourth section, "Nutrition and Dental Caries," probably the most controversial, has been distributed in draft form to a group of consultants. Two further sections are contemplated. "The Pathology of Dental Caries" is being reviewed by Dr. Charles F. Burdeker, and "The Epidemiology of Dental Caries," by Sidney D. Finn. Upon completion of these reviews, the various sections will be correlated and prepared for publication in monograph form.

Dr. Icie Macy Hoobler reported for the Committee on Maternal and Child Feeding, which is working closely with the obstetric and pediatric professions for improvement of the nutrition of mothers and infants.

Dr. P. C. Jeans reported for the Committee on Institutional Feeding, which is cooperating with the American Dietetic Association and the American Hospital Association in efforts to improve nutritional practices in small hospitals and other institutions.

Dr. John D. Black, chairman, Committee on Food Economics, with the assistance of Dr. D. A. FitzGerald, Director-General of the International Emergency Food Council, apprised the Board of the current food situation. Increased production of cereal crops in the U. S. is largely offset by decreases in other parts of the world so that the supply of energy-producing foods is still short. Fats and oils, also in this category, remain well below prewar levels.

Dr. R. S. Goodhart reported for the Committee on Nutrition of Industrial Workers, which has active programs being conducted by its Subcommittees on the Relation of Nutrition to Physiological Stress and to Toxic Reactions in Industry. The responsibilities of this committee have been considerably extended because the government agency in the USDA concerned with industrial feeding has been discontinued.

Dr. Charles G. King reported for the Committee on Survey of Food and Nutrition, which is undertaking a

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comprehensive review of food research in the U. S. with the support of the Quartermaster Food and Container Institute of the Armed Forces. This is a unique effort to compile all active research in a special field into a central registry where the overall coverage can be reviewed.

Dr. W. H. Sebrell of the National Institute of Health presented a report prepared especially for the Milk Committee by an *ad hoc* committee consisting of Dr. F. F. Tisdall, Dr. I. M. Hoobler, and himself for evaluation of school milk feeding programs. This report outlines minimum measurements and observations which are considered essential for evaluating benefits from supplemental milk feeding in School Lunch Programs. The outline will serve as a guide to those who may wish to undertake such studies.

Dr. E. L. Sevringhaus presented an account of observations in Puerto Rico on the nutritional status of the population. The island offers unlimited opportunities for nutritional studies because of the geographic situation and the economic status of the people.

The Board was fortunate in having as its guest during the meeting Sir Edward Mellanby, secretary, British Medical Research Council. At the dinner meeting of the Board on May 9, Sir Edward outlined the evaluation of the international viewpoint of science, especially with regard to nutritional practice. Dr. Robert F. Griggs addressed the Board on this occasion with regard to the place of the National Research Council in the scientific life of the nation and the growth, development, and influence of the Food and Nutrition Board.

Army Dietitians. The War Department issued a circular, No. 113, dated May 3, 1947, which outlines the method of application for dietitians who wish to serve in the Women's Medical Specialist Corps of the Regular Army.

According to this pamphlet the total authorized minimum strength of the Dietitian Section will be 159 persons. Only applicants who have served as Army dietitians in the grade of second lieutenant, first lieutenant, and captain are eligible for initial integration appointments to the Dietitian Section. Applications must be made on WD AGO Form 102 (Application for Commission in the Army Nurse Corps or Women's Medical Specialist Corps, Regular Army) and must be prepared in duplicate. They must be forwarded on or before July 31, 1947. After that all appointments will be made in the grade of second lieutenant. Applications may be obtained from Army general hospitals; headquarters, zone of interior armies; the American Dietetic Association; the Surgeon General's Office, Attention, MEDCM-B, Washington 25, D. C., and headquarters, overseas theaters and departments.

A recent change in the organizational set-up in Army hospitals provides that the Chief Dietitian carry the title of "Hospital Food Service Supervisor" and that she is in full charge of all food preparation. The title of "Mess Officer" has been abolished and replaced by "Hospital Mess Administrator." This officer will be in charge of the hospital fund, store rooms, procurement, and inventory of all equipment and supplies requisitioned by the Chief Dietitian. Both are directly responsible to the commanding officer of the hospital, although, of course, they will work closely together.

Public Relations Committee Meeting. On May 3, the Public Relations Committee of the American Dietetic Association met in the Association's Chicago office to discuss objectives and plan steps to be taken in achieving these objectives. Helen Robertson, chairman of the Committee, presided. Others who attended included Elizabeth Perry, Co-Chairman; Helen Hamilton; and all members of the A.D.A. staff. Lucille Hecht, editor of the *Altrusan*, who will handle publicity for the A. D. A. convention in Philadelphia in October, also attended for part of the meeting. Dr. Neige Todhunter was unable to be present.

New Food and Nutrition Board Committee. The first meeting of the Committee on Institutional Feeding of the Food and Nutrition Board of the National Research Council was held in Washington on May 8. The Committee, which was appointed in the winter, is headed by Dr. P. C. Jeans, State University of Iowa, Iowa City. Other members of the Committee are: Mable MacLachlan, President of A.D.A.; Dr. Helen A. Hunscher, President-Elect of A.D.A.; Maxine Turner, Community Nutrition Section Chairman of A.D.A.; Bertha Biltz, A.D.A. Administrative Adviser; Dr. Icie Macy Hoobler, Children's Fund of Michigan; and Hazel K. Stiebeling, Bureau of Human Nutrition and Home Economics, Department of Agriculture.

University of Illinois Installation of New President. Elaborate ceremonies marked the installation of George Dinsmore Stoddard as tenth president of the University of Illinois on May 15 and 16. On May 15 functions were held in Chicago, including a convocation at Navy Pier, at which Charles Luckman, an Illinois alumnus now president of Lever Brother Company, spoke, and a banquet at the Drake Hotel for which the principal speaker was General Omar N. Bradley. A special train took participants to Champaign-Urbana for the second day of the ceremonies, at which President Stoddard officially took office. In the afternoon, after the installation, a symposium on higher education was held, at which Dr. Robert M. Hutchins, chancellor of the University of Chicago, and Dr. Archibald McLeish, former Assistant Secretary of State and U. S. representative at UNESCO, were speakers. The installation was attended by delegates from universities, colleges, learned societies, and national, educational, and professional organizations. Beulah Hunzicker, treasurer of the American Dietetic Association, represented the Association.

A. D. A. Member Wins Fellowship. Mary K. Bloetjes, director of nutrition at the Hospital for Joint Diseases, New York City, and president of the Greater New York Dietetic Association, has been awarded one of fourteen scholarships presented by the American-Scandinavian Foundation for study in Scandinavian countries. Mrs. Bloetjes will study management of food service departments in hospitals in Scandinavian countries during her ten-week stay. Since its inception, the Foundation has sponsored the interchange of students between the U. S. and Denmark, Iceland, Norway, and Sweden. This year approximately 500 students from Scandinavia are studying in American institutions through the aid of the Foundation.

Government Openings for Dietitians. An announcement issued by the Civil Service Commission states that positions for dietitians are open at St. Elizabeth's Hospital, Freedmen's Hospital, Gallinger Hospital, and Glenn Dale Sanatorium—all government hospitals in Washington—and in the U. S. Public Health Service Hospitals throughout the country. Salaries range from $2644 to $4902 a year with grades from P-1 to P-4. Further information and application forms may be obtained from most first- and second-class post offices, Civil Service Regional offices, or from the U. S. Civil Service Commission, Washington 25. Applications will be accepted until further notice.

New Hospital Administration Courses: *Yale University*, New Haven, Connecticut, has been given a grant to found a graduate program in hospital administration. The course as planned will last at least twenty-one months, nine of which will be spent in residence at the University. This will be followed by an administrative internship or residency. Those completing the course will be awarded master's degrees.

Washington University, St. Louis, has also announced the inauguration of a hospital administration course. Physicians holding an M. D. degree or persons with a bachelor's degree in arts and sciences will be eligible for this course. Advanced students or hospital administrators may be

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admitted as special students. This course, too, will last for twenty-one months, nine of which will be devoted to classroom instruction, and twelve to an internship. As interns, the students will receive experience in the various hospital departments as well as an overall view of the administrative field. Students who complete the class work and internship and submit a thesis will be granted a degree of Master of Hospital Administration. Those who do not complete theses will be awarded Certificates in Hospital Administration.

A program in hospital administration which will offer internship and residencies leading to the degree of Master or Doctor in Hospital Administration has been announced by the *State University of Iowa*, Iowa City. The program will offer an administrative internship for a period ranging from six to eighteen months. Throughout the training, candidates will attend various hospital conferences and meetings, and in addition periodic conferences with department heads will be held. On entrance, candidates will be enrolled in the Graduate College of the University, which will provide an opportunity of enrolling in classes which appear necessary to fill gaps in the candidate's background. The academic portion of the program will be varied to suit the needs of the individual. In addition to the in-service training program offered at the State University of Iowa Hospitals, in-service training will also be given at smaller community-operated private hospitals in the state which are not so closely integrated with a teaching and research hospital, such as the university hospital. Persons in the hospital field who have demonstrated unusual achievement and graduates of the academic portion of the hospital administration courses offered by other universities are eligible for admission.

Dietetic Internship at Veterans Administration, Los Angeles. In October, 1946, the training course for dietetic interns at the Veterans Administration Center, Los Angeles, was approved by the Executive Board of A. D. A. This is the largest installation of its kind in the U. S. and has among its facilities Wadsworth General Hospital and an annex which accommodate 1784 beds, and a Neuropsychiatric Hospital of 2042 beds, which is one of three selected to specialize in the treatment of brain disorders. Wadsworth General Hospital is one of four Veterans Hospitals which offers approved training for dietetic interns. The main body of lectures in diet therapy for dietetic interns are presented by the resident and consultant staffs of the VA, the latter being specialists. Dietetic interns are allowed to audit lectures given at the Center by the members of the medical staff of the University of Southern California and the Southern Branch of the University of California. A continuous lecture series in neuropsychiatry is likewise open to the dietetic interns during the training assignment at the Neuropsychiatric Hospital. Other phases of the training are given through affiliations with the Hospital of the Good Samaritan for private room service, the Children's Hospital for pediatrics, and the Public Health Department for community nutrition. The Personnel Division of the Center gives aid in the techniques of training employees, in assisting the student to prepare job breakdowns, and in working out teaching assignments using training films and visual aids. The dietetic interns also have access to surgery, to post-mortems, to the Departments of Radiology and of Physical Medicine, and to the weekly conference of the Social Service Department at the Neuropsychiatric Hospital.

Cornell Summer Course in Menu Planning. A one-week course in menu planning was conducted by Arnold Shircliffe for the summer course in hotel administration offered at Cornell University, Ithaca, New York, from June 30 to July 5. Mr. Shircliffe, manager of the Wrigley Building Restaurant in Chicago, used as illustrations for his lectures many of the menus in his famous collection, which includes historical examples of restaurant menus as well as those offered by modern restaurants and hotels.

Ohio State Opens Course in Restaurant Management. At the request of the Ohio Restaurant Association, Ohio State University will inaugurate a program of training in restaurant management. Two types of courses will be offered: one, stressing administration, will be offered by the College of Commerce and Administration and will lead to a regular degree from that college, while the other will emphasize food production and will be offered by the Division of Institution Management of the School of Home Economics. Work in this latter course will lead to a special degree of Bachelor of Science in Restaurant Management.

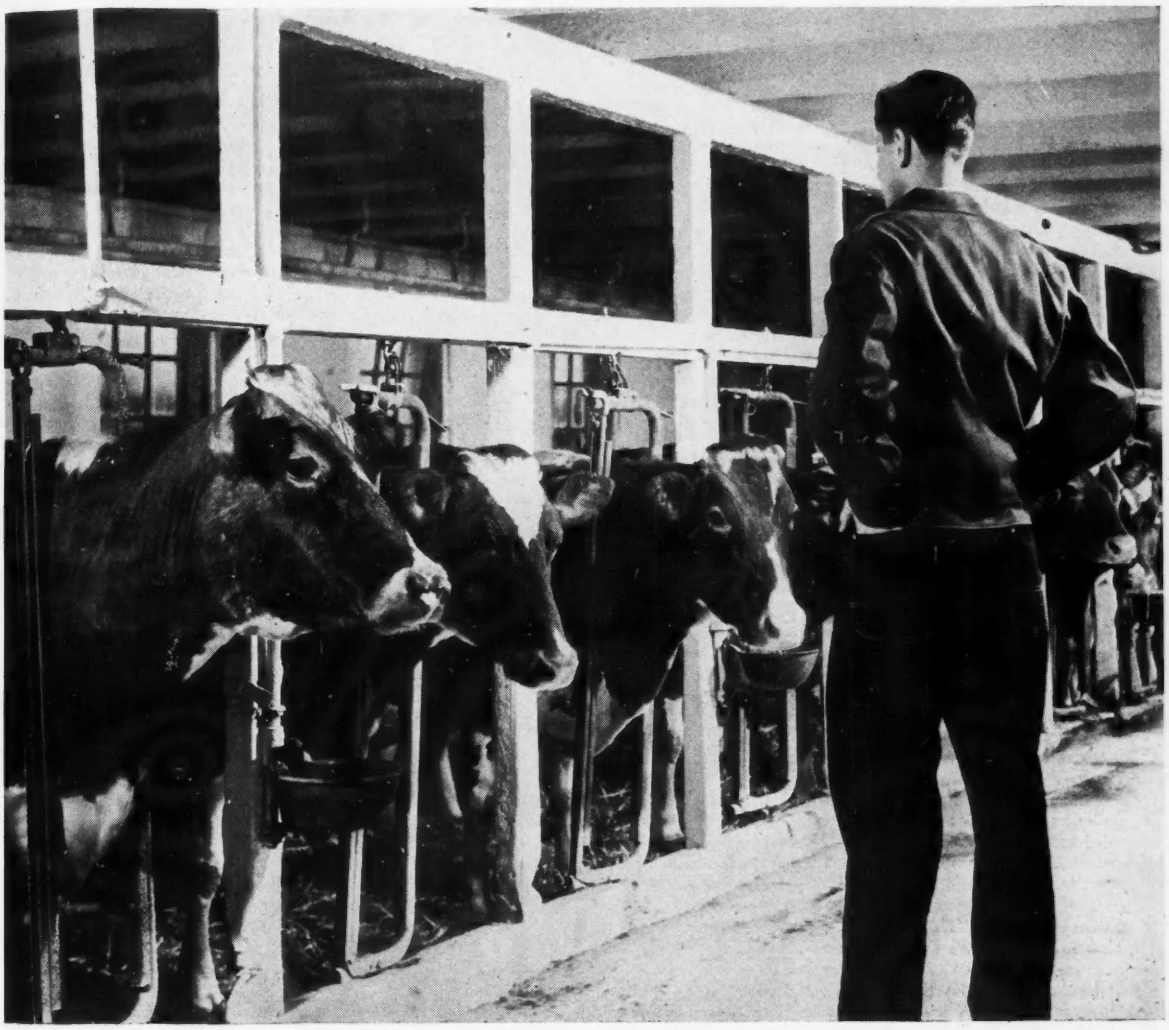
Vassar Summer Institute. Announcement has been made that the dates for the twenty-second Vassar Summer Institute will be July 9 to August 6. Among the seminars offered will be a course for parents in homemaking and efficient household management which will include family budgeting; techniques of housekeeping to encourage family cooperation; clothing and styling for children, adolescents, and adults; principles of nutrition, cooking, and planning family meals; and marketing.

Mountain-Plains Regional UNESCO Conference. The first regional conference ofthe United Nations Educational, Scientific, and Cultural Org anization (UNESCO) took place in Denver, May 15 to 17. Some 1780 persons representing 1000 organizations attended this Conference and came from Colorado, Idaho, Kansas, Nebraska, New Mexico, Oklahoma, Utah, and Wyoming. The American Dietetic Association was proud to be represented by Mary Ellen Johnson, president, Colorado Dietetic Association, and Margaret Cowden Bernard, chief, Dietetic Division, Branch No. 13, Veterans Administration.

Five Plenary Sessions were held, as well as subject-matter forums and organization sections and workshops. Key speakers on the various subject fields gave addresses. At one of the Plenary Sessions, Howard Wilson, Association Director of the Division of Education, Carnegie Endowment, spoke on the plan of work for UNESCO. The first enterprise deals with the problems of rehabilitation, relief, and reconstruction in the fields of education, science, and culture for devastated countries. The second lies in the area of education for international understanding and includes the exchange of student, teachers, and professional people, as well as the study of school systems and curricula of various countries. The third enterprise is an attempt toward stamping out illiteracy and provision for fundamental education for all ages of people. The fourth and last enterprise is in the field of applied science, and each country must be willing to coordinate scientific research material.

At the Science Section meeting the four UNESCO programs in the natural sciences were discussed. They include: (a) Hilian-Amazon Project; (b) provision for Field Science Collaboration offices; (c) encouragement of scientific publications; and (d) encouragement of popularization of natural sciences. These meetings stressed the advances made in the mountain-plains region which are significant in other areas of the world, including the work in astronomy of the High Altitude Observatory, Climax, Colorado; the study of surgical dressing technique in battle wounds; rendering sea water fit for human consumption; isolating and manufacturing of material to prevent clotting of blood; and discovery and use of DDT, penicillin, and malaria control.

A.D.A. Now Affiliated with A.A.A.S. As of April 27, 1947, the American Dietetic Association became an affiliated society of the American Association for the Advancement of Science. Previously, we had had the status of an associated society since June 24, 1925. Our official repre-



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We're glad to be Joe's partner in his important job. He produces the milk. Here at National Dairy, we process it, package it, protect its quality all the way to you. We turn it into rich cheese, butter, ice cream and other foods. Our laboratories constantly improve familiar foods, develop new ones.

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sentative on the A.A.A.S. Council will be Dr. Neige Todhunter, head, Department of Food and Nutrition, University of Alabama, who is a Fellow of the A.A.A.S.

A.D.A. has been invited for the second time to sponsor a Dietetic Section program at the A.A.A.S. winter meeting to be held December 26 to 31 of this year in Chicago. The program committee for this meeting is under the chairmanship of Martha Trulson, Veterans Administration, Chicago. Other members of the committee include Ella Marie Eck, Margaret H. Brookes, Elva Hiscock, Ella Jane Meiller, and Aileen Merwin. The program for the meeting last December was planned by a committee under Elizabeth Caso, Harvard School of Public Health, as chairman.

Sanitation Courses in New York City a Success. The four-day conference on food sanitation conducted by the New York City Department of Health in cooperation with the Greater New York Dietetic Association drew an excellent attendance—109 persons. Some 4800 food handlers, who prepare 167,000 meals per day, are under the immediate supervision of the persons who attended this conference, and it is probable these workers will, in turn, receive instruction in food sanitation from their supervisors either on the job or in classes.

VA Graduates Ten Dietetic Interns. Five dietetic interns completed their training at the Veterans Administration Hospital, Los Angeles, in May. They are: Geraldine Louise Dunn, Genevieve Heinz, Barbara Reeder, Naomi Ruth Watson, and Lois McDonald. Interns who graduated from the training course at the Veterans Administration in the Bronx, New York, in June were: Alice Godwin, Roberta Jean Watters, Doris Acorn Fraser, Fredricka Selene Huggins, and Dorothy N. Horridge.

Records for Use in Recruiting. The Ohio Fuel Gas Company, Columbus, has prepared a series of eight phonographs records designed to point out to high school and college girls the job opportunities in home economics. In addition, a booklet, *Careers in Home Economics*, has been published for use in conjunction with the playing of the records.

The first two records are titled "Introduction to Home Economics" and "Homemaking and Teaching," and were planned to be played first. Then others in the series may be chosen to meet the needs of the particular group. Record III is titled "Dietitian and Food Director for Airline." Others in the series cover "Merchandising—Textiles—Restaurant Management," "Home Service," "Food and Equipment Research," "Child Development—Extension Workers," and "For the Girl Who Doesn't Plan to Go to College."

The records are available for loans, and although extremely popular, a set was obtained and played at the Ohio Dietetic Association meeting held in Dayton in April.

HEIB Field Days. The New York Home Economists in Business group on May 2 sponsored a field day, to which home economics students and members of the faculties of more than two dozen nearby colleges attended. Co-chairmen of the event were Elizabeth Sweeney of *McCall's* Magazine and Ina S. Lindman of United Fruit Company. Students, faculty, and members of the group heard talks by leaders in food, textile, equipment manufacturing. utility, women's magazine, radio, advertising, and publicity fields. Guided field trips to outstanding business firms who use home economists in significant jobs was a special feature of the program. Students majoring in food, nutrition, and equipment visited *Good Housekeeping* offices and the Sealtest Laboratory Kitchen. Helen C. Hamilton, Corn Products Refining Company, and a member of the A.D.A. Public Relations Committee, spoke on Foods in Business," while Katharine Fisher of *Good Housekeeping* talked on "The Magazine World." Field Day was concluded with a dinner at the Seamen's Church Institute at which a panel discussion "Let's Talk It Over" was held. During the discussion the ideal requirements for home economists in the utility, textile, and food fields were discussed. Dr. Helen Judy Bond, Teachers College, Columbia University, suggested that business offer "interships" to home economics students and emphasized the availability of the college placement service to business employers. Also included among the discussants was Eleanora Sense, editor, *Forecast* Magazine.

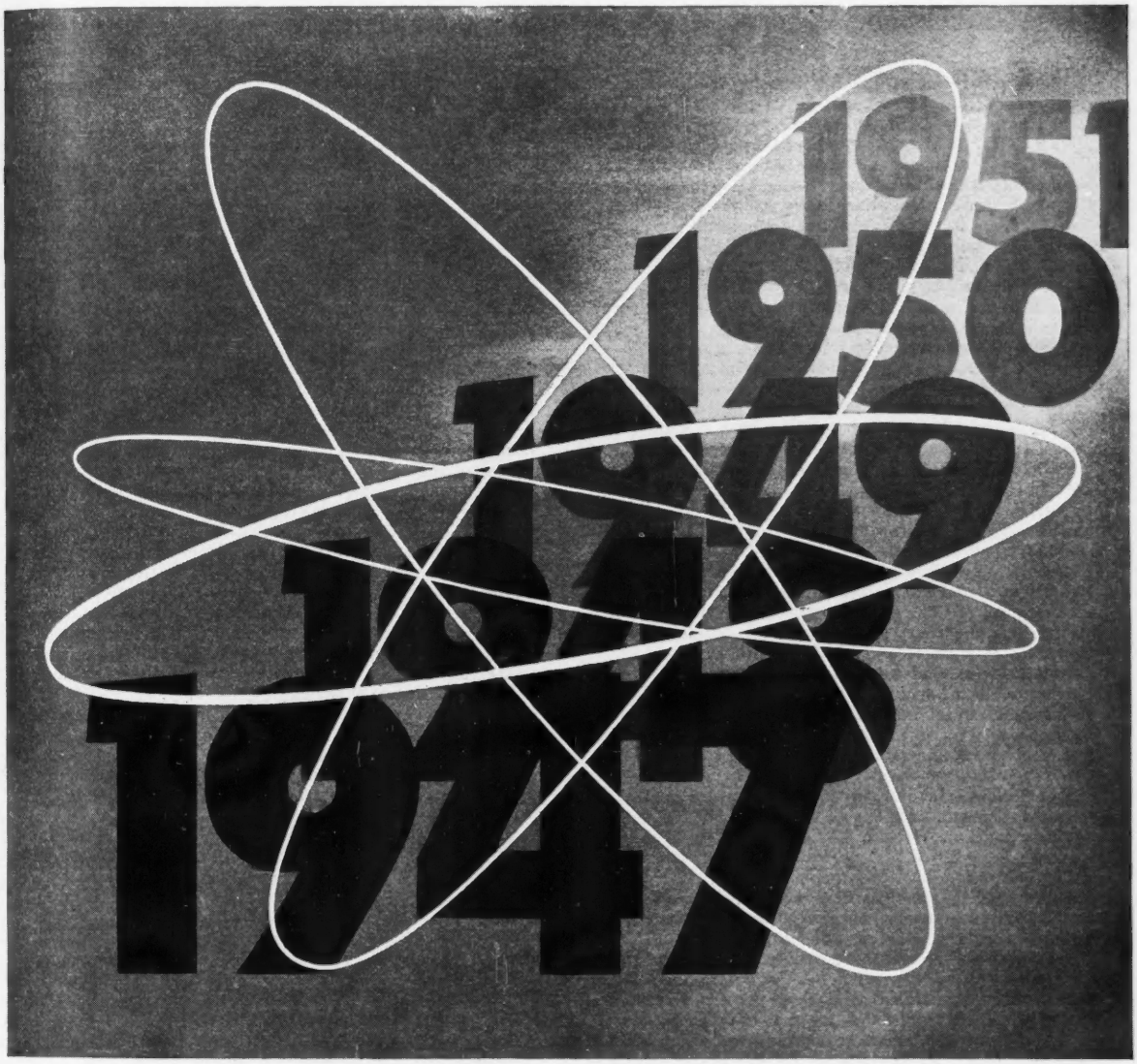
Chicago Home Economists in Business were also hostesses for a similar program on April 25 and 26, which was attended by 184 junior and senior home economics students and forty-six faculty members representing nineteen midwestern colleges. The program opened with a review of professional problems which young women in business face. It included a dramatized presentation showing job application etiquette and discussions on the first days on the job, trials and triumphs of the job, and horizons ahead for the home economist in business. Field trips were conducted through Chicago business organizations representing various phases of home economics, including the test kitchens of a food company and a tearoom. On the second day, outstanding women in each phase of business home economics spoke of the requirements and opportunities in their individual fields. An interesting highlight was a dinner for faculty and HEIB members to discuss mutual problems of curriculum, placement, and apprenticeship. The program was carried out under the direction of Beth Bailey McLean, director of home economics, Swift and Company Research Laboratories.

Contest for Hospital Booklets. The American Hospital Association has announced that contests for employee information booklets and school of nursing brochures published by hospitals are being conducted by the Public Relations Council of that organization. Closing date of the contest is September 1, 1947, and awards will be made at the Association's convention in St. Louis, September 22 to 25. These contests will replace the Public Education Contest of former years. Objective of the contests is to stimulate interest in these types of publications as public relations tools and to encourage production of better publications. Entry blanks may be obtained from the Council. The contests are open only to institutions which are members of the A.H.A.

Home Economics Career Information. The Agricultural Extension Service of the University of Missouri has recently issued Circular 535 titled "You Can Be a Home Demonstration Agent." It is a photographic story of the work of the home demonstration agent. The pictures are excellent and the copy is short and to the point. There is little, however, on training.

New Diet Manual. Philadelphia General Hospital has recently issued a new *Diet Manual*, which was prepared by Elizabeth Miller, chief dietitian, in conjunction with the hospital's Committee on Diets of the Medical Board and Dietetic Department. It covers various therapeutic diets and includes, as well, formulae for tube feedings, composition tables, method of converting diet figures into actual foods, and fundamental information about vitamins.

Hospital Planning. One section of the May, 1947 issue of the *Bulletin of the American Institute of Architects* was devoted to hospital planning. Included was an article titled "Schematic Plans for Hospitals" by Perry B. Johanson, Seattle architect who served as adviser for the project on planning the dietary department of the Food Administration Section of A.D.A. The report of this committee was published in the January, February, and March issues of the JOURNAL. In addition to comments by architects on hospital planning, this issue of the *Bulletin* gives a comprehensive bibliography. Fourteen references pertaining



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to planning for food service are listed, a number of which have been written by members of A.D.A.

***Journals* Needed in China and the Philippines.** The Henry Lester Institute of Medical Research in Shanghai, China, has made an appeal for copies of the JOURNAL which would replace lost files or numbers which did not reach them during the war. Since nutrition is their major subject of research, our JOURNALS are desperately needed. Issues which are requested are: Vol. 16 (1940), Nos. 4, 5, and 6; Vol. 17 (1941), Nos. 8, 9, and 10; Vols. 18–23 (1942–47), complete. Anyone who has copies she would be willing to send to this Institute should write to Dr. Helen S. Mitchell, Massachusetts State College, Amherst.

A similar request has come from Quintin A. Eala, chief, Scientific Library, Department of Agriculture and Commerce, Bureau of Science, Manila. Contributions of any back or current issues of the JOURNAL will be gratefully received by this library and should be sent directly to the above address.

New Appointment at Food and Container Institute. Colonel Charles S. Lawrence, commanding officer, Quartermaster Food and Container Institute in Chicago, recently announced the appointment of Dr. Howard D. Lightbody as chief, Food Research and Development Division. Dr. Lightbody was formerly chief, Biochemical Division, Western Regional Laboratory of the Department of Agriculture, Albany, California. He has also served as research chemist for the Food and Drug Administration and as instructor in chemistry at Michigan State College.

American Hospital Association Appointment. Margaret Carrington, R.N., has been appointed to the staff of the American Hospital Association. Her duties will include assistance in the Association's nurse recruiting campaign and on matters pertaining to professional training. Miss Carrington has, for fourteen years, been director of the School of Nursing and of Nursing Service at Michael Reese Hospital, Chicago. She has also served on the faculty and teaching staffs at Western Reserve University School of Nursing; Yale University School of Nursing; and Miami Valley Hospital School of Nursing, Dayton. She holds a master's degree from Teachers College, Columbia University, and is a member of the board of directors of the National League of Nursing Education.

Technique for Freezing Peaches. Home economists of the Department of Agriculture have found that a small amount of powdered ascorbic acid dissolved in sugar sirup prevents peaches from darkening during freezing, as well as the off-flavors and general deterioration which accompany browning. In addition, it enhances the nutritive value by changing the frozen peaches from a naturally poor source of ascorbic acid to an excellent source.

Browning has been a problem in both home and commercial freezing of peaches and other light-colored fruit, for it is caused by oxidation which is speeded up by enzymes in the fruit. Heating will inactivate the enzymes and prevent browning, but it gives the fruit a cooked quality. To keep the fresh flavor, texture, and color, cut surfaces of the peaches must be completely protected from the air, which is the job done when enough sugar sirup with ascorbic acid added is used to cover the fruit. The most palatable peaches were those packed in a 40 per cent sirup—about 3 cups of sugar dissolved in 4 cups of water.

USDA Tips on Cooking Asparagus. Department of Agriculture home economists suggest when cooking whole stalks of asparagus that the stalks be tied together loosely. Then, they should be stood upright in a saucepan or kettle in boiling, salted water deep enough to cover about one third of the height of the stalks. The pan should be covered and the asparagus cooked 10 to 25 min., or until tender. In cooking pieces of asparagus, they suggest that asparagus be cut in 2-in. lengths and the pieces from the lower part of the stalk be put into a small quantity of boiling, salted water. These may be cooked from 5 to 10 min. before the tips are added.

***Serving Many* Discontinued.** Persons connected with large scale food service were sorry to learn that curtailment of some of the activities of the Department of Agriculture has necessitated the discontinuance of its Industrial Feeding Program on May 28. With the May issue, the publication *Serving Many* was also discontinued, due to the retrenchment program.

Rule for Heating Milk. Studies in the Idaho Experiment Station and other laboratories have shown that riboflavin is destroyed easily by light and that this destruction is hastened by heat. Milk boiled in light lost considerable riboflavin, but that boiled in the dark lost comparatively little. The Department of Agriculture, therefore, recommends that the pan be covered when heating milk. This plan has other advantages, too. The milk heats slightly faster, and when it has reached the boiling point, it holds the boil with less heat. The use of a cover also helps to prevent the formation of a "skin" on the surface of the milk.

New Film. Films on health and hygiene have been made available either for loan or purchase by the U. S. Public Health Service. They are 16 or 35 mm. in size. The films may be purchased by obtaining a price list and authorization forms from the Surgeon General, U. S. Public Health Service, Washington, D. C. (Bethesda Station). To borrow films, state or local health departments should be contacted. A recent release, *On Your Feet*, could be used by dietitians in training personnel, for it covers good posture, properly fitted shoes, and how to walk correctly.

Electronic Cooking Installation. The Boston Statler Hotel recently made history by being the first hotel to contract for the installation of electronic cooking equipment. More about the principles and speed of electronic cooking is given in the article by Owen Webber which begins on page 604 of this issue of the JOURNAL.

Committee Will Help Combat Antivivisection. An important step toward the segregation of the antivivisection forces from true humane organizations is represented by a newly-established joint committee of the American Humane Association and the National Society for Medical Research. Robert F. Sellar, president, American Humane Association, stated in a newspaper interview that antivivisection groups are campaigning vigorously for the protection of animals, but that they have no connection with his organization.

News of State Associations

Colorado Dietetic Association. Representatives of Denver's home economics faculties and students were entertained at the May 16 meeting of the *Denver Dietetic Association* held at Children's Hospital. Fifty members and guests were present. The theme of the meeting was recruitment, with representatives of various home economics fields giving brief talks about their work. After the program tea was served.

Louisiana Dietetic Association. A joint meeting was held May 23 and 24 in Lafayette, Louisiana, with the Louisiana Hospital Association. Topics discussed included "Meat for Institutional Use" by J. B. Francioni of Louisiana State University, Baton Rouge, and "The Louisiana Study of Child Health Service," by Dr. Joseph L. Rosenzweig, American Academy of Pediatrics, Shreveport. Sister Euphemia, director of the Dietary Department, Charity Hospital, New Orleans, discussed "What the Hospital Superintendent Can Expect of a Dietitian." For the meeting an elaborate printed program was prepared which included quotations from "Dietitians in Demand," and two pages of photographs of dietetic interns and dietitians at work.

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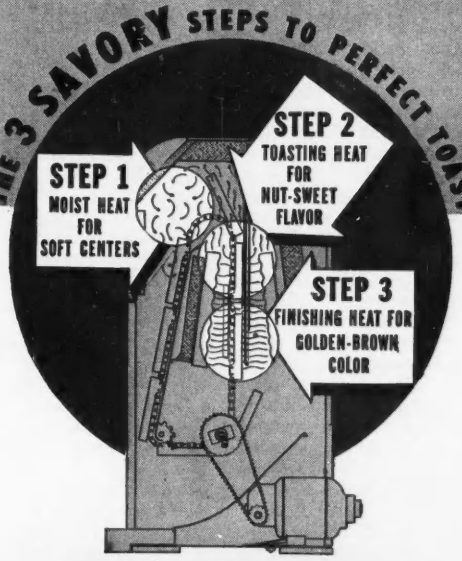
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The *New Orleans Dietetic Association* in December entertained with a Christmas party in the lounge of the Student Nurses' Residence of Charity Hospital. At the January meeting, Angela Gregor, personnel counselor of Celotex Corporation, spoke on "Personnel Problems Resulting from the War," while at the February meeting, Dr. Posey, psychiatrist from the Veterans Hospital, was guest speaker. Officers of the New Orleans Association for this year were: President, Madge Myers; President-elect, Agnes Blazek; Vice-president and Program Chairman, Frances Sanders; and Secretary-Treasurer, Mary Lou Hinson.

Maine Dietetic Association. The first annual meeting of the Maine Dietetic Association was held on May 10 in Augusta in conjunction with the annual convention of the Maine Home Economics Association. Featured speaker of the dietetic meeting was Alice M. Easton of H. A. Johnson Company, Boston. Her topic was "Building Good Nutrition into Menus."

Maryland Dietetic Association. New officers elected at the May meeting are: President, Jane Hartman, Maryland State Department of Health; President-elect, Mary Reinhardt, Mercy Hospital, Baltimore; Vice-President, Margaret Weskett, City Hospital, Baltimore; and Treasurer, Janette Carlsen, The Johns Hopkins Hospital, Baltimore.

Massachusetts Dietetic Association. Members of the Massachusetts Dietetic Association met for their annual meeting on Saturday, May 10, at Massachusetts State College, Amherst. Dr. Ralph Van Meter, Dean of the School of Horticulture, discussed new varieties of apples which have been developed and will soon be on the market, while Dr. Carl Fellers, Department of Food Technology, talked on new developments in processing and marketing. An election of officers was held, with the following results: President, Marion Floyd, Massachusetts General Hospital, Boston; Vice-President, Elizabeth Caso, Harvard School of Public Health, Boston; Secretary, Harriet Wright, Pratt Diagnostic Hospital, Boston; and Treasurer, Helen McDonald, New England Baptist Hospital, Boston.

Minnesota Dietetic Association. The January meeting of the *Rochester Dietetic Association* was devoted to a discussion of marketing problems. Earl C. Wolf, purchasing agent of St. Mary's Hospital, analyzed prevailing conditions in regard to food buying and predicted general trends, while R. L. Larson, representative of Swift and Company, carried on an informal discussion of the present situation in meat buying and grading. At the February meeting, Dr. W. C. Alverez, Mayo Clinic, spoke on "Food Sensitiveness." In March an open meeting for other professional groups was held, at which Dr. Ancel Keyes, University of Minnesota, talked on "Rehabilitation Following Severe Undernutrition." The April get-together took the form of a "quiz" program with Mayo Clinic fellows and assistant doctors competing with dietetic interns of St. Marys Hospital.

The *Twin City Dietetic Association* has also had an active year. In January the dietitians of Miller Hospital provided a demonstration and lecture on their new pressure cooker. Within an hour whole hams, navy beans, and rice may be prepared with their new equipment. At the March meeting held at St. Barnabas Hospital, Dr. Russell M. Wilder, Jr., talked on "Non-Tropical Sprue" and the use of folic acid in its treatment. In April the association was invited to meet at the Veterans Hospital, where, after a tour of the Dietary Department, E. E. Speer, Jr., executive officer, Medical Rehabilitation Section, spoke on "Medical Rehabilitation in Veterans Administration Hospitals."

Missouri Dietetic Association. Guests at the April meeting of the *Columbia Dietetic Association* were juniors and seniors who are majoring in dietetics and nutrition at the University of Missouri. Mary Reeves, president of the Missouri Dietetic Association, spoke on nutrition in relation to public health.

New Hampshire Dietetic Association. The seventh annual meeting of the New Hampshire Dietetic Association was held at the Eagle Hotel, Concord, on May 7. A feature of the occasion was a birthday cake cut by Helen Gilson of Milford, a past president of the New Hampshire Association. Sarah Thames, director of the dining hall at the University of New Hampshire, was appointed to distribute recruiting information to high schools in the state. Alice Fenno, Food Administration Section Chairman of A.D.A., spoke on "The Role of the Dietitian of Today and Tomorrow." A number of hospital administrators within the state attended the meeting as well as dietitians.

New York State Dietetic Association. The Sixteenth annual meeting of the Association, held at Lake Placid on May 22 and 23, had as its theme "Nutrition in Action." Some 160 members attended the convention, which was considered an unusually successful meeting. A number of papers presented at this meeting will be published in future issues of the JOURNAL. Alliene Mosso, St. Luke's Hospital, New York City, was chosen as president-elect at the election of officers.

Ohio Dietetic Association. The *Akron Dietetic Association* completed its second year of organization with a meeting in June. During the year ten regular meetings were held—five of which were social in nature and five were concerned with business and professional matters. In the past two years the membership has increased from thirteen to thirty-four members who represent various types of food service throughout the city.

The *Cincinnati Dietetic Association* planned its programs for 1946–47 so that each section conducted one meeting. The Community Nutrition Section, under Florence Skroch, discussed the interrelationship of the various community agencies within Cincinnati. The Food Administration Section, in addition to working on state projects, sponsored a "Food Parade" for which members demonstrated their favorite recipes. These recipes were later collected and mimeographed for the Association by the Mills Restaurant. The Diet Therapy Section this year has reviewed each month sixty periodicals and prepared a mimeographed digest of administrative and therapeutic material for members. The Professional Education Section has been extremely active in recruiting. One important step in this work has been the establishment of radio and press contacts. The committee has worked with the Home Economics Association and the Home Economists in Business in planning a joint recruiting meeting, to which members of the Board of Education and vocational advisers of the public schools were invited as guests. One meeting, planned by dietetic interns in Cincinnati, took the form of a discussion of foreign and racial food habits with exhibits of typical foreign dishes. The Ways and Means Committee raised funds through a combined style and bridge party given at one of the department stores.

The *Cleveland Dietetic Association* activities for the year have included seven meetings and additional work on section projects. In March, a dinner meeting held for the Home Economics Association drew 200 people. Speaker of the evening was Dr. John M. Flumerfeld, assistant director, Psychiatric Clinic, Lakeside Hospital and Western Reserve University, whose topic was "Psychology and the Family." The Community Nutrition Section devoted its time to a "Good Lunch Program" and contacted schools to stimulate checking of lunches. The Diet Therapy Section made a survey concerning the use of salt-free and of acid ash and salt-free diets. The Food Administration Section made a study of food cost control and sent a questionnaire to forty-one hospitals and other commercial organizations operating non-profit cafeterias. The Professional Educa-

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tion Section has sent periodicals and books to the Philippines. Its greatest effort has been directed toward recruitment, with "Dietitian Week" in May as the highlight of the year.

Monthly meetings have been held by the *Columbus Dietetic Association* from October through June. At the October meeting, Elizabeth Sweeney of *McCall's* Magazine, spoke on "Equipment in the News." Other meetings were devoted to employee relations, sanitation, recruitment, and therapeutic uses of folic acid.

Oklahoma Dietetic Association. More than 150 dietitians attended the ninth annual meeting of the Oklahoma Dietetic Association held April 11 and 12 in Oklahoma City at the Skirvin Hotel. Featured speaker of the convention was Dr. Mohammed Abdo Abbasy of Cairo, Egypt, who is a senior staff member of the FAO. He spoke on "The Significance of Nutrition and Food Problems in the Operations of the United Nations Organization." Other speakers were: C. R. Boyle, manager, H. D. Lee Company, Kansas City, Missouri, who discussed food prices and predicted that costs will soon be forced down because of demand. Dr. Alfred H. Free, Miles Laboratories, Elkhart, Indiana, talked on a new vitamin soon to be introduced to the public which has anemia-preventing powers. E. U. Benson, business manager, Payne County Masonic Hospital, Cushing, Oklahoma, pointed out the problem of the small hospital unable to employ qualified dietitians, while S. Margaret Gillam discussed the service offered to such hospitals by the American Hospital Association. As a special feature of the meeting, a reception was held for Oklahoma City and county high school senior girls, at which time three dietetic interns discussed careers in dietetics.

Pennsylvania Dietetic Association. A joint annual meeting of the Pennsylvania Dietetic Association and the Pennsylvania Home Economics Association was held May 23 and 24 at the Bellevue-Stratford Hotel, Philadelphia. Dr. A. Hodges Bryant of the Frozen Food Institute spoke on "Frozen Foods Today and Tomorrow." Also on the program was Dr. Helen A. Hunscher, President-Elect of the American Dietetic Association, who discussed opportunities open in the field of home economics and dietetics. Dr. Henrietta Fleck, chairman, Home Economics Department, New York University, emphasized that dietitians and home economists can help to raise the world's standard of living by combatting malnutrition, which is a serious obstacle to world peace. Other speakers were Dr. Ruth Harley Weaver, Division of Medical Service, Philadelphia Board of Education, who spoke on "Health Status of Pupils in Philadelphia," and Rheta B. Hyatt, nutritionist, Pennsylvania Department of Public Health, whose topic was "The Better Breakfast Campaign in Bridgeport, Connecticut."

News about Members

The following members of the American Dietetic Association have recently accepted new positions and appointments:

Frances Adamo, formerly a member of the dietary department at Mt. Sinai Hospital, Philadelphia, is now at Wilkes-Barre General Hospital, Wilkes-Barre, Pennsylvania.

Corinne Baker has left Touro Infirmary, New Orleans, and is now director of dietetics at Ochsner Foundation Hospital, New Orleans.

Elizabeth Hope Basom on March 17 became head dietitian, Maryland State Department of Health, Ritchie Hospital, Cascade, Maryland. Previously she was therapeutic dietitian at San Jose Hospital, San Jose, California.

Harriet W. Boyle is no longer at the Connecticut State Tuberculosis Sanatorium, Norwich. She recently accepted a position as assistant dietitian at the New York Hospital Westchester Division, White Plains, New York.

Maxine Bradford Cerise, recently discharged from the Army, is the new dietitian of the metabolic unit at the Ochsner Foundation Hospital, New Orleans.

Catherine Collier, formerly dietitian at Scott and White Hospital, Temple, Texas, has opened her own "Party House" for catering to private groups.

Georgia Crane has left Salt Lake City and has moved to Berkeley, California, where she is on the dietary staff at Alta Bates Hospital.

Marion Myers DeLong completed her dietetic internship at The Johns Hopkins Hospital, Baltimore, in April and is now dietitian at University Hospital, Philadelphia.

Ann Drogden, until recently assistant dietitian at Tennessee Coal, Iron, and Railroad Company Employees Hospital, Fairfield, Alabama, is now cafeteria dietitian at Hermann Hospital, Houston, Texas.

Lois Seyfried Dwyer, a recent graduate of the approved course for dietetic interns at University of California Hospital, Berkeley, is now therapeutic dietitian at Sonoma County Hospital, Santa Rosa, California.

Pauline Epstein has been transferred from the Veterans Hospital, Newington, Connecticut, to Birmingham Veterans Hospital, Van Nuys, California.

Marjorie K. Foster, previously chief dietitian at Jefferson Davis Hospital, Houston, Texas, is the new administrative assistant at Methodist Hospital, Houston.

Clara Gaetjens recently became chief dietitian at St. Joseph Hospital, Asheville, North Carolina.

F. Inistore Godfrey, having completed her dietetic internship at The Johns Hopkins Hospital, Baltimore, is now assistant dietitian at Tennessee Coal, Iron, and Railroad Company Employees Hospital, Fairfield, Alabama.

Jessie Harriss, formerly dietitian at Scottsdale Mills Cafeteria, Scottsdale, Georgia, recently became a member of the dietary department at Egleston Memorial Hospital for Children, Atlanta, Georgia.

Mary Evelyn Jefferson began her duties as therapeutic dietitian at Vanderbilt University Hospital, Nashville, Tennessee, on March 16.

Mary Maren Johnson is no longer at New York Hospital, New York City. She is now employed at the F. G. Shattuck Company of the same city.

Elizabeth Ann Kane, following her resignation as assistant food supervisor at Hotel Statler, St. Louis, became cafeteria manager, Cleaver-Brooks Industrial Plant, Milwaukee, Wisconsin.

Christie L. Kerth, a graduate dietetic intern from Massachusetts General Hospital, Boston, is now nutritionist, Michigan State Sanatorium, Howell.

Dorothy Kessler has left San Francisco to become therapeutic dietitian at St. John's Hospital, Cleveland.

Flemmie P. Kittrell, head, Department of Home Economics, Howard University, Washington, D. C., has recently returned from Liberia, Africa, where she conducted a nutrition survey for the State Department.

Wava Knapp is the new dietitian at Grandview Hospital, La Crosse, Wisconsin.

Bernes E. Larson resigned as nutrition consultant, New Orleans Department of Health, and is now nutritionist for the Department of Health, Louisville, Kentucky.

Patricia Leonard, previously dietitian at Alton Memorial Hospital, Alton, Illinois is the new dietitian at Hibbing General Hospital, Hibbing, Minnesota.

Sarah Anne Ling, upon completion of her training as a dietetic intern at University Hospitals, Cleveland, became assistant therapeutic dietitian at the same hospital.

Claire Means Little is the new pediatric dietitian at University Hospitals, Cleveland.

Althea Lloyd has moved from Murphysboro, Illinois, to Compton, California, where she is now a member of the dietary department at Las Campanas Hospital.

Florence Bevins Melick, following her separation from

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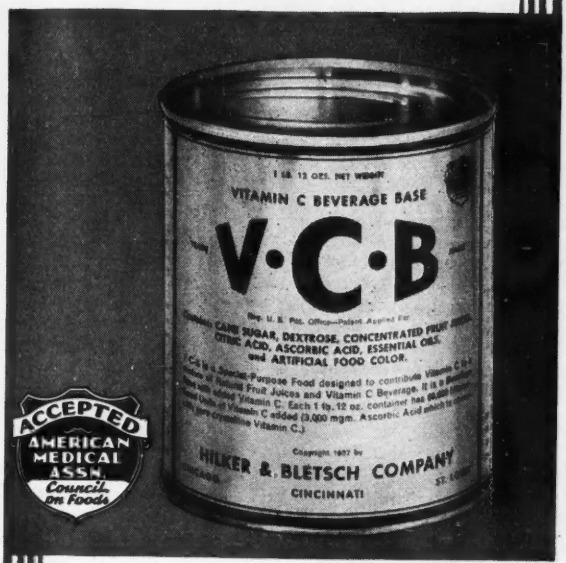
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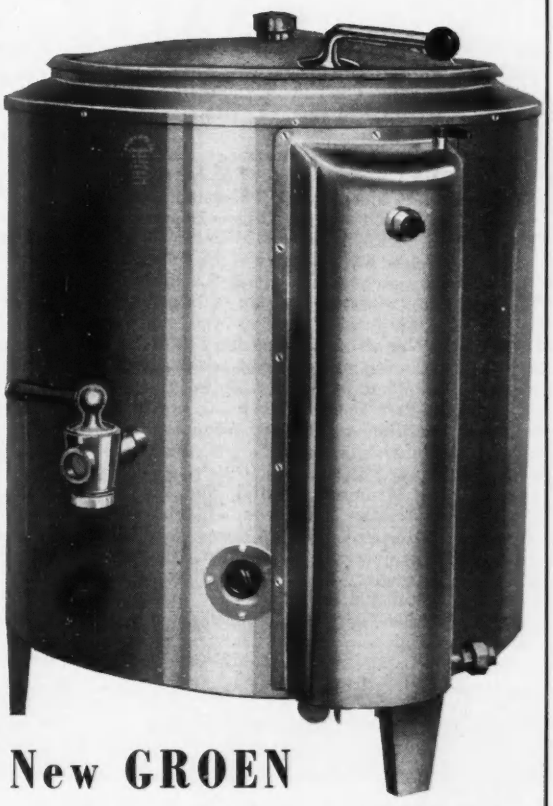

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the Army, accepted a position at Morristown Memorial Hospital, Morristown, New Jersey.

Maude Middleton is now on the dietary staff at Johnston-Willis Hospital, Richmond, Virginia. She was previously with the Army.

Lois Mollinger on June 2 became staff nutritionist for the American Red Cross, Chicago.

Louise Smith Moody has left Brookline, Massachusetts, to accept a position with the Illinois Department of Public Health, La Moille, Illinois.

Carolyn Nelson was a member of the February graduating class from Massachusetts General Hospital, Boston. She is now assistant research dietitian at Oakland Naval Hospital, Oakland, California.

Kathleen Newell has resigned her position at Butterworth Hospital, Grand Rapids, to accept a position as staff dietitian at Colorado General Hospital, Denver.

Vivian R. Parr is no longer living in Chicago. She is now staff dietitian at Veterans Administration Hospital, San Fernando, California.

Agnes Oettle Payton has left Babylon, New York, to begin work at Memorial Hospital, New York City.

Charlotte Perkins is the new administrative dietitian at Hermann Hospital, Houston, Texas.

Jean Petley, formerly dietitian at The Johns Hopkins Hospital, Baltimore, is now staff dietitian at Temple University Hospital, Philadelphia.

June Pettibone, previously teaching dietitian at University Hospital, Ann Arbor, Michigan, is now a member of the dietary department at Virginia Mason Hospital, Seattle.

Mary H. Philbrick has resigned from Floyd Hospital, Rome, Georgia, to accept a position at St. Joseph's Infirmary, Atlanta.

Doris Rabinowitz, until recently at Walter Reed Hospital, Washington, D. C., is now at Mt. Sinai Hospital, New York City.

Wilma Robinson, formerly chief dietitian at Cambridge Hospital, Cambridge, Massachusetts, has accepted a position as consultant for state institutions, Division of Maternal and Child Hygiene, Department of Public Health, Springfield, Illinois.

Berdena Rosenow is now employed at University of Kansas Hospitals, Kansas City. Previously she was at St. Luke's Hospital, New York City.

Ethel Wiley Samson, is the new home demonstration agent for Ulster County Extension Service, Kingston, New York.

Stella Sanborn, until recently a member of the dietary staff at St. John's Memorial Hospital, New York City, has now become cafeteria supervisor, Bendix Corporation, Teterboro, New Jersey.

Cissy Shigetomi on March 24 became administrative and therapeutic dietitian at Chicago Memorial Hospital, Chicago. She is a recent graduate of the course for dietetic interns at Michael Reese Hospital of the same city.

Betty J. Snyder, recently returned from overseas where she served with the Army, is now at Victory Memorial Hospital, Waukegan, Illinois.

Elizabeth Starr, formerly at Olive View Sanatorium, Olive View, California, is now administrative dietitian, Harbor Hospital, Los Angeles County Department of Charities, Torrance, California.

Ida Strickland has resigned from Hermann Hospital, Houston, Texas, to accept a position as dietitian at Memorial Hospital in the same city.

Virginia G. Swift is now a member of the dietary department at Grace-New Haven Community Hospital, New Haven, Connecticut. Until recently she was clinic dietitian, University Hospitals, Cleveland.

Jewel Marie Swindle began work on May 1 as assistant dietitian at Palo Alto Hospital, Palo Alto, California. Previously she had been at Stanford University Hospital, San Francisco.

Alice Lagerstrom Thomas, formerly an Army dietitian aboard a hospital ship, is now head of dietetics, Seattle College, Seattle, Washington.

Andromache Tsongas is now in Athens, Greece, with the Food and Agriculture Organization. Prior to this she was living in Lowell, Massachusetts.

Elizabeth Van Alstyne, who has been assistant dietitian in residence halls, Connecticut College, New London, will begin her position with the New York Telephone Company, New York City, on July 21, 1947.

Margaret Webb, after leaving Mt. Sinai Hospital, New York City, became chief dietitian at Mercy Hospital, Vicksburg, Mississippi.

Ida Wides is the new administrative dietitian at Mt. Sinai Hospital, Chicago. She recently left her position at Vallejo Community Hospital, Vallejo, California.

Wilma Son Yost, previously clinic dietitian at St. Luke's Hospital, Chicago, is now at Good Samaritan Hospital, Dayton, Ohio.

Announcements of the following marriages have been received in the JOURNAL office.

Janet Josephine Acker was married on June 1 to Richard Schwarck in Bloomington, Indiana. The Schwarcks are now at home in San Antonio, Texas.

Anna Mae Allen is now Mrs. Walter Jordan. She will continue her work as assistant administrative dietitian, Louisville General Hospital, Louisville, Kentucky.

Elizabeth McGregor Breeden on May 31 became Mrs. William Duncan McLaurin. They are now at home in Columbia, South Carolina.

Roberta T. Coffman (neé Thomas) has moved from Detroit to Jackson, Mississippi, where she is employed at Veterans Administration Hospital.

Mary Frost was married to J. H. Underhill on April 5 in Glendale, California.

Helen Gallagher (neé Weist) is a new bride living in Philadelphia.

Claire Gerhardt, former assistant administrative dietitian, Good Samaritan Hospital, Dayton, was married to Alvin J. Cummins on June 14.

Marion Hitchcock is now the wife of Richard D. Lisle and will continue to live in Grafton, Ohio.

Ruth E. Kincaid of Allentown, Pennsylvania, was recently married. Her new name is Jarrett.

Jane Eleanore Knight, formerly a member of the dietary staff at Bradford Hospital, Bradford, Pennsylvania, is now Mrs. Robert L. Jahnke of Indianapolis, Indiana.

Elizabeth Anne Kratt recently became the bride of John Linnehan.

Marguerite A. Lipscomb was married to John A. Spaulding in March.

Minna Lee McCarthy has resigned her position as pediatric dietitian at New York Hospital, New York City, to become Mrs. J. D. Cassels, Jacksonville, Florida.

Barbara McCurry became head dietitian at Hotel Dieu, El Paso, Texas, following her marriage to William T. Robinson.

Helen Miller resigned her position at Warren Hospital, Phillipsburg, New Jersey, to move to San Jose, California, with her new husband, Howard S. Martin. Mrs. Martin is now employed at Alum Rock Sanatorium.

Wilma L. Miller, formerly dietitian at Minneapolis General Hospital, Minneapolis, was recently married to Irving D. Schneider and has moved to Duluth, Minnesota. She is now a member of the dietary department at Miller Memorial Hospital.

Iris Preston (neé Young) previously on the dietary staff at Alta Bates Hospital, Berkeley, California, is now living in Mesa, Arizona.

Lottie M. Reed was married to Charles Stuart on April 7 and has moved from Santa Barbara to San Francisco.

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Bernice Frances Selzer recently became Mrs. Walter P. Hummel. She has resigned her position at Flushing Hospital, Flushing, New York, and is now living in Ozone Park, New York.

Dorothy Sitton (neé Boliek), formerly of Tallahassee, Florida, is now at home in Trion, Georgia.

Priscilla J. Sizemore (neé Johnson) will continue to live in Louisville following her recent marriage.

Mary Sloan on March 17 became Mrs. Lawrence E. L'Herisson. She is now staff dietitian at the Shreveport Charity Hospital, Shreveport, Louisiana.

Mary Jean Sloanaker, formerly dietitian and food manager for Ireland's Restaurants, Portland, Oregon, is now the wife of Dr. A. E. Smith and is living in Spokane, Washington.

Jane F. Taylor's new name is Pace, not Rice, as stated in the May issue of the JOURNAL.

Elsa Louise Will, formerly head dietitian at University of Houston, Houston, was married to Charles W. Wright on April 26. The couple will make their home in Dallas, Texas.

News of Advertisers and Exhibitors

A new catalog has been issued by the publishers of *Institutions Magazine* which contains over 630 pages of helpful information for restaurants, hospitals, schools, hotels, and industrial plants. The catalog lists almost all products used in the institutional field, as well as the names and addresses of the manufacturers of the products. The Reference Data Section contains basic information necessary to the operation of an institution, with prize-winning food service layouts of various types of institutions. . . . The *John Van Range Company* of Cincinnati is this year celebrating its 100th year of service. In connection with this anniversary, an elaborate and attractive book has been published with pictures and photographs of representative installations of the company's equipment in institutions throughout the country. . . . *Detroit-Michigan Stove Company*, in its 1946 annual report, pictures the assembly line in the production of its stoves. With the increased use of "bottled gas" both in homes and commercial plants, the company foresees a vast new market opening up. . . . *S. Blickman, Inc.*, has announced a full, Pressure-Type Tri-Saver twin urn of stainless steel equipped with Tri-Saver permanent stainless steel filers. Capacities of twin urns range from 3 to 6 gal. for each liner, and heating units are obtainable for gas, steam, or electricity. . . . *General Foods* recently published its annual report for 1946. In addition to the customary financial report, the booklet includes charts, graphs, and photographs depicting the year's progress. . . . Representative of the J. B. Ford Division of *Wyandotte Chemical Corporation* recently attended Service Refresher Clinics in New York, Pittsburgh, Atlanta, Chicago, Kansas City, Indianapolis, Toronto, and San Francisco. . . . The *National Turkey Federation* has released a new booklet titled *Turkey Handbook* for use in institutions, hotels, and restaurants. The booklet is well illustrated with photographs of turkey production, grading, preparation, and the finished dishes. The booklet is obtainable for 25 cents. . . . Mary Alden, director of the Home Economics Department of *Quaker Oats Company*, recently prepared answers to numerous letters about breakfast in a folder called "Breakfast Mail Call." It contains breakfast menus and recipes and answers the most frequent questions about what is a good breakfast, how to prepare a quick breakfast or a party brunch, and so on. . . . *G. S. Blodgett Company* announces that monel metal is now being used for almost the entire construction of many of its ovens. Both interior and exterior surfaces subject to corrosion are made of rustproof monel. . . . This month what is said to be the first completely automatic waffle iron will be introduced to the restaurant and institution trade by the *Doughnut Corporation of America*. It will be called the "Downyflake Waffle Robot." The waffle baker requires no greasing and the automatic batter dispenser pours the correct amount of batter for each waffle, making twenty-two waffles without supervision.

Improved Therapy of Rocky Mountain Spotted Fever

Rocky Mountain spotted fever is a disease common to all parts of the United States. It is serious and often fatal. Because cases are so widely scattered throughout the country, most physicians have had little opportunity to develop an adequate concept of treatment. However, Dr. Samuel F. Ravanel of Greensboro, North Carolina, has made observations which help to formulate such a plan. His proposed treatment was used in five cases of the disease. By administering adequate doses of para-aminobenzoic acid, and giving supportive therapy in the form of plasma and whole blood, dextrose, salts, vitamins, and amino acids, he achieved rapid and brilliant results. The temperature dropped, the rash faded, and recovery ensued. These observations suggest that deaths from Rocky Mountain spotted fever may be practically eliminated by treatment with para-aminobenzoic acid combined with properly controlled supportive therapy.—Abstracted from a paper by Samuel F. Ravenel, M.D., titled "Para-aminobenzoic acid therapy of Rocky Mountain spotted fever", *J. A. M. A. 133: 989 (April 5), 1947.*

Ways to Promote Citrus

At the American Chemical Society meeting in Atlantic City in April, Dr. Herbert C. Gore suggested that attractive concentrated sirups could be made by boiling orange and grapefruit juices in open kettles. Dr. Gore described methods used experimentally to produce such sirups and reported that they were stable, with attractive colors and flavors. He explained that a straight sirup or a neutral sirup can be produced—the neutral sirup being the result of treatment with calcium carbonate to neutralize the free acids.

Along the same line—that is, developing new uses for citrus fruits—a company in Lakeland, Florida, has worked out a method for extracting the oil from citrus seeds. This oil may be utilized in making cooking oil, mayonnaise, plastics, and soap. The seeds are dried before the oil is extracted, and at present 50 tons of seeds a week are used. Future plans include the production of four other citrus by-products. *Food Field Reporter, April 28, 1947.*